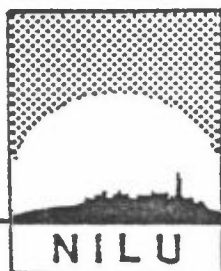


NILU : OR 66/84
REFERANSE: E-7950
DATO : DESEMBER 1984

*THE CHEMICAL COMPOSITION OF AEROSOLS
MEASURED IN SOUTHERN SCANDINAVIA*

J.M. Pacyna, B. Ottar and J.E. Hanssen
Kåre Kemp*



NORWEGIAN INSTITUTE FOR AIR RESEARCH

ROYAL NORWEGIAN COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH

NILU : OR 66/84
REFERANSE: E-7950
DATO : DESEMBER 1984

*THE CHEMICAL COMPOSITION OF AEROSOLS
MEASURED IN SOUTHERN SCANDINAVIA*

J.M. Pacyna, B. Ottar and J.E. Hanssen
Kåre Kemp*

*Danish Air Pollution Laboratory
Research Establishment Risø
4000 ROSKILDE
DANMARK

NORSK INSTITUTT FOR LUFTFORSKNING
POSTBOKS 130, 2001 LILLESTRØM
NORGE

ISBN 82-7247-540-5

ABSTRACT

A series of aerosol measurements have been carried out at three of the Nordic EMEP stations in February - June 1980 to assess the impact of long range transport of air pollutants from continental sources on their concentrations in remote areas. The results show that measured concentrations of several air pollutants at Birkenes (Norway), Rörvik (Sweden) and Virolahti (Finland) can be related to calculated anthropogenic emissions for a number of constituents, (e.g. V, Pb, Ni, Mn, Cu, and As) for selected days with only slowly changing air trajectories. The measurements performed in two particle fractions made it possible to select a group of elements as tracers for the East European vs. West European aerosols measured at receptors in Scandinavia. The group includes: As, Cr, Cu, Mo, Se, Sn and V measured in fine fraction of particles.

LIST OF CONTENTS

	Page
1 INTRODUCTION	5
2 THE ANALYSIS OF TRACE ELEMENTS.....	7
3 CONCLUSIONS	14
REFERENCES	15
APPENDIX 1	
APPENDIX 2	

**THE CHEMICAL COMPOSITION OF AEROSOLS
MEASURED IN SOUTHERN SCANDINAVIA**

1 INTRODUCTION

The European programme for monitoring and evaluation of the long range transmission of air pollutants (EMEP) is based on the preparatory work which has been carried out by the nordic countries, and funded by the Nordic Ministerial Council (NMR) since 1977. In 1982, this work had advanced far ahead of EMEP. It had become evident that years would pass before the more advanced methods for sampling and chemical analyses, which had been developed and tested by the laboratories in the Nordic Countries (NMR, 1983) could be genuinely applied within EMEP. In consequences, the direction of the NMR programme was changed, and it was agreed to examine to what extent application of the methods which had been developed, would provide a better understanding of the long range transport of the air pollutants.

One of the main ideas which had been developed within the NMR programme, was that size fractionated sampling and chemical analysis of the aerosols might provide data which were more directly related to the long range transport of the air pollutants. Today, it is generally agreed that the volume size distributions of the aerosols in and near cities and highly industrialized areas normally show two maxima (Whitby, 1978). Fuel combustion and many industrial processes initially produce a large number of very small particles in the size range below 0.05 μm . Also the conversion of gaseous components initially leads to particles in this size range. However, within a few hours most of these very small particles agglomerate and end up in the size range 0.05 - 2.5 μm , the so-called accumulation mode. Because of reduced mobility further agglomeration becomes a very slow process. Recent measurements in the Arctic indicate that this size range may narrow down to 0.15 - 1.0 μm after several days of transport in the boundary layer. Measurements at 4000-5000 masl indicate that particles which are brought into the free troposphere may agglomerate into the range 2-3 μm before they are brought into the Arctic by the general subsidence over the Polar region.

Particles larger than 2.5 μm are generally produced by various mechanical processes, and their deposition by gravity cannot be neglected. In remote

areas most of the larger particles therefore originate from natural processes in the vicinity of the measuring station (windblown dust, sea salt particles).

Under normal atmospheric condition, the aerosols in remote areas therefore show a bimodal volume size distributions, and theoretically the particles smaller than $2.5 \mu\text{m}$ should be more closely related to the long range transport than the bulk sample. However, the separation between samples representing the two modes cannot be made very sharp, there will always be some overlap. Furthermore, the chemical equilibration between the ions NH_4^+ , Cl^- , NO_3^- and the corresponding gaseous components NH_3 , HCl , HNO_3 may lead to an exchange of these ions between the two size fractions, if these are collected on the same filter.

On this basis it was decided to undertake a series of aerosol measurements at three of the Nordic EMEP stations in April-May 1980. The stations Birkenes in S. Norway, Rørvik near Gothenburg in Sweden and Virolahti in SE Finland were selected for the study. For southerly winds all these stations are exposed to long range transport of air pollutants from continental sources, and with the open sea in between disturbing local sources were largely eliminated. For other wind directions the source situation is the more complex, but generally the local emissions at these stations are small in relation to continental sources and well known.

The measurement programme included the regular EMEP measurements of SO_2 and bulk aerosol samples which are analyzed on SO_4 - on a 24 h basis. In addition, the two-filter method (Heidam, 1981) was used to collect aerosols in two size fractions: particles smaller than $2.5 \mu\text{m}$ and particles in the range $2.5 \mu\text{m}$ to $15 \mu\text{m}$. Particles larger than $15 \mu\text{m}$ were removed at the air intake.

The aerosol samples were analyzed by particle induced X-ray emission analysis PIXE. The data have been analyzed in different ways using a trajectory model and trajectory sector statistics.

The results of these studies are discussed in the following chapters.

2 THE ANALYSIS OF TRACE ELEMENTS

The daily concentrations of all elements measured in the two aerosol fractions are given in Appendix 1. The average concentrations of these elements for the whole period of measurements are listed in Fig. 1, and the contribution of the concentrations in fine fraction in Fig. 2. Of the elements S, V, Pb, Zn, As, Ni, Se, Br, and Sb, more than 60% is found in the fine fraction of particles, while for Al, Si, Ca, Ti, Rb, Sr, Zr, Ba, and Fe, more than 60% is in the coarse fraction. The elements Cr, Mn, Cu, and Mo are more equally distributed between the two fractions. The contribution of the fine fraction for Cl changes from ~20% for Birkenes, ~40% for Rørvik to ~60% for Virolahti. Cd and Sn were only found regularly in concentrations above the detection limit ($\sim 2 \text{ ng/m}^3$) at Rørvik. This element distribution is normal. The fine fraction consists of anthropogenic pollutants emitted mainly during high temperature processes, such as fossil fuel combustion, non-ferrous metal production, steel and iron manufacturing, and waste incineration. The elements in the coarse particles are of natural origin. The elements Cr, Mn, and Cu belong to both groups. The high contribution of Cl to the coarse particles at Birkenes is due to sea-salt particles. The importance of this source is less at Rørvik and particularly at Virolahti. The contribution of the Cl emission from coal combustion is likely predominant at the latter station and important for the former one. Evidently both groups of elements (anthropogenic and natural) can be released from local sources around Birkenes, Rørvik, and Virolahti or as a result of long range transport of air pollutants from sources far away.

To examine the importance of local vs. distant sources, the concentration of several elements in the fine fraction of the particles were studied in the period when all stations were in operations. The results are given in Figures 3-14 for As, Zn, Cu, V, Mo, Pb, Br, Ni, Ca, Se, and Fe, respectively. Concentration peaks occur for almost all the above mentioned elements for samples collected at Birkenes and Rørvik during 14-16 April, while the peaks at Virolahti are for samples collected 2 days later. An examination of meteorological maps indicates transport of air masses from central Europe to Scandinavia during this period. But, since the ratios between the elements are different for these stations, the particles measured at Birkenes, Rørvik and Virolahti probably passed different emissions centres in Europe. A detailed examination of the 850 mb air

trajectories at Birkenes and Rørvik indicates, however, a similar history of the air masses, (no trajectories were available for Virolahti which had passed over the Federal Republic of Germany, the Netherlands, the German Democratic Republic, and Denmark).

The origin of aerosols measured during the period 14-16 April, 1980 at Birkenes and Rørvik was then analyzed by receptor modelling. A simple trajectory model was used to calculate the trace metal concentrations, and the estimates were compared with the measurements. The model was the same as used in a previous study of the long-range transport of trace elements in Europe (Pacyna et al., 1984) and in the Arctic (Pacyna et al., 1985). The 850 mb trajectories were calculated at the Norwegian Meteorological Institute, for each emission grid element every 4 hours. The trajectories for the period 14-16 April, 1980 are presented in Figure 15.

The model is based on the mass-balance equation (Eliassen and Saltbones, 1982):

$$\frac{dq}{dt} = (1 - \alpha) \frac{Q}{h} - k q \quad (1)$$

q = trace element concentration in the air, ng/m^3

t = time, s

Q = trace element emission per unit area and time, $\text{ngm}^{-2}\text{s}^{-1}$, referred to the EMEP grid system of 150x150 km

h = height of mixing layer, m

k = decay rate for the trace element considered (wet and dry deposition), s^{-1}

α = part of trace element emission deposited in the same grid element as it is emitted. This local deposition supplements the deposition included in the decay rate, k

The trace element emissions per unit area and time have been presented earlier, (Pacyna, 1982). As an example the vanadium emission in Europe for 1979 is shown in Figure 16. The shaded areas represent locations with emissions higher than the average in a grid of 150 x 150 km. Only anthropogenic sources were considered in the calculations. The amounts of trace elements released from natural sources in Europe are relatively insignificant, mainly due to the absence of desert areas and low emission

from European volcanoes.

Based on data by Eliassen and Saltbones (1982), a constant mixing height of 1000 m was used and the wet deposition was not considered in calculating the decay rates. This may lead to a slight overestimate of the trace element concentrations. Based on the literature review by Davidson, the following dry deposition velocities were assumed to be representative for the decay rate calculations in the study region: 0.1 cm s⁻¹ for lead, 0.2 cm s⁻¹ for arsenic, 0.3 cm s⁻¹ for vanadium and 0.4 cm s⁻¹ for copper, nickel and manganese. (Several papers by Davidson, e.g. Davidson, 1980.) An "α" coefficient of 0.15 has been used in this work. (Pacyna et al, 1985).

The mass balance equation (1) was integrated along trajectories consisting of N sections or timesteps Δt to obtain:

$$q(N\Delta t) = q(0) e^{-kN\Delta t} + \sum_{i=1}^{N-1} (1-\alpha) \frac{Q_i \Delta t}{h} e^{-k(N-i)\Delta t} \quad (2)$$

where:

- q(NΔt) = trace element concentrations at the end of the trajectory, ng m⁻³
- q(0) = trace element concentrations at the start of the trajectory, ng m⁻³
- Q_i = trace element emission in the i-th grid, ng m⁻² s⁻¹
- N = number of trajectory sections
- Δt = timestep of 4 hours, S

The measured and calculated concentrations of some selected trace elements are presented in Figure 17. The best agreement was obtained for manganese and nickel. Estimated concentrations are slightly higher for copper and lower for arsenic. Measured concentrations are significantly higher for vanadium and lead. The poor agreement in the case of these two elements is likely due to additional emissions from local combustion of residual oil and gasoline.

Summarizing, a good agreement between measurements and estimates, as well as 850 mb trajectories prove that the pollution load measured at Birkenes and Rørvik in the period April 14-16, 1980, has originated in central Europe,

particularly in the industrial regions of the Netherlands, the Federal Republic of Germany, German Democratic Republic and Denmark.

The air trajectories indicate a major contribution from the German Democratic Republic at Rörvik, and from the Federal Republic of Germany at Birkenes. The measured ratio of Mn to V, the most commonly used elemental tracer (Rahn, 1981) is different for the two stations.

The SO_4^{-2} , NO_3^- and Cl^- concentrations clearly follow the concentrations of trace elements discussed above, see Figure 18 20. Extremely high concentrations were observed during the period April 14-16, 1980 for iron and calcium in the fine fraction of particles. Iron and calcium are known as metals of natural origin. However, the anthropogenic sources may also contribute to the element concentrations, particularly in the fine fraction. Coal combustion in electric utilities and industry is the most important source for both Fe and Ca. Fe may also be emitted during iron, steel and ferroalloy manufacturing. These two high-temperature sources are widely distributed in central Europe.

At Virolahti, the peaks of the Cu, V, Ni, Mn, Mo, Ca and Fe concentrations appear 2-3 days later than the peaks at Birkenes and Rörvik. This may suggest that the same pollution transport was measured at all three stations, with the distance between the stations resulting in the time differences. However, there are elements invalidating this hypothesis. The As, Pb, Br and Se concentrations do not show even enhanced concentrations during that time. Thus, gasoline combustion, the main source of Pb and Br emissions (anthropogenic Br) does not seem to affect the pollution load at Virolahti in the period 16-18 April 1980. This is rather surprising, however, the more significant influence of emission sources in Eastern Europe may be expected. Remarkable that for some elements, such as Mn, Ni and Mo concentrations at Virolahti are higher than those at Rörvik and Birkenes in the discussed period of time. Thus, one explanation is, that high peaks of the element concentrations at Virolahti are due to long range transport but from other sources than suggested for Birkenes and Rörvik. The transport sector calculations indicates transport from north, which may suggest the industries on the Kola peninsula as a source. The other explanation of the high concentrations of several elements at Virolahti in 16-18 April 1980 is that these pollutants are emitted from local sources in

Finland or sources nearby Leningrad in the Soviet Union. As the majority of gaseous pollutants is subject to long range transport, the local deposition of SO_4^{-2} , NO_3^- , Cl^- and Se and Br is of less significance.

The influence of local sources on the element concentrations at Birkenes, Rörvik and Virolahti is more evident in the other case. Extremely high concentration of As, Zn, V, Ni, Pb, Br, SO_4^{-2} , NO_3^- and Cl^- were observed at Rörvik on 5 April 1980. The wind trajectories indicated air masses arriving at Rörvik from the north direction. (See Fig. 21) Our station is situated on a peninsula 30 km south of Gothenburg (0.5 million inhabitants). The most important sources, that seemed to contribute to the pollution load at Rörvik on 5 April are garbage incineration in Gothenburg, metal works and particularly Olof Manner in Mölndal, indicated in Monitor 1982 (Naturvårdsverket, 1982) and oil combustion. High concentrations of Pb and Br are due to gasoline combustion in the Gothenburg area. The trace element concentrations at Birkenes can be enhanced by local emissions from Kristiansand (25 km south), while the nearest important source area affecting Virolahti is located in the Soviet Union.

The impact of metal emissions in Europe on the concentrations measured in Scandinavia, can be assessed not only from concentrations measured during episodes of long range transport as shown above for the period 14-16 April, but also from a sector analysis of daily mean concentrations over the whole period of sampling. The average concentrations of all chemical compounds measured during the campaign are presented in Appendix 2 for four sectors. The concentrations of fine and coarse fractions are shown separately for all three stations. The sectoral contributions of Pb, S, Ca, V, Al, Zn and Mn are also given in Figures 22-28. The SE sector was dominating at Birkenes for K, Ca, Ti, V, Cr, Fe, Cu, Zn, As, Se, Br, Sr, Pb and SO_4^{-2} in fine particles. The second southern sector SW was equally or even more important at Rörvik. Generally, the two southern sectors, that can be called "European" sectors, dominated at Birkenes and Rörvik. The ratio of the average concentrations in northern sectors at Birkenes to the average concentrations in southern sectors can be used to assess the Norwegian and foreign contributions. The same ratio calculated for Rörvik may roughly separate the Swedish and foreign contribution, however, an effect of emission sources in Norway cannot be excluded. The Norwegian relative contributions of fine mode at Birkenes and the Swedish fine mode relative

contributions at Rörvik are presented in Table 1 for some anthropogenic pollutants. Emissions from sources in Norway seem to contribute as much as 20-30 per cent to the fine particles at Birkenes for several anthropogenic pollutants, except Mn and Ni. The Norwegian contributions for Mn and Ni are about 50 per cent. This is somewhat surprising in the case of Ni. The main source of Ni emission is oil combustion, being also a major emitter of V. The Norwegian contribution of the latter element is only a half of that for Ni. Thus, there is either an additional source of Ni in the neighbourhood of Birkenes or other foreign contribution from north, e.g. industrial area on the Kola Peninsula in the Soviet Union. The last explanation does not seem to be appropriate. There is, however, the old Ni-mine at Evje which operated in the past. Re-entrainment of dust from this activity is an alternative possibility. An examination of meteorological maps shows that approximately 70% of the air masses at this station were arriving from north.

The Swedish contribution at Rörvik, indicated in Table 1, is even higher than for Birkenes. This may be emissions in the Gothenburg region. Also, a major part of the Swedish metallurgical industry is located north-east of Rörvik. This may be significant for the Zn, Cr, Mn and Fe concentrations at the Rörvik station.

The NE sector was dominating at Virolahti for a number of chemical compounds measured in this work, including Si, K, Ca, Cr, Mn, Fe, Zn, As, Mo and Sn. The concentrations measured in this sector are may be due to emissions from several sources in the Soviet Union. Emissions from other sources in the Soviet Union affect the concentrations in the SE sector at Virolahti. Generally, the elemental concentrations at Virolahti are more evenly distributed over the sectors than the concentrations at Birkenes and Rörvik.

Sector analysis can also be performed by means of elemental diagrams for each sector at each station. Such diagrams are shown in Fig 29-32 for NW, NE, SE and SW sectors, respectively. The element concentrations relative to the V concentrations were plotted for trace elements with more than 60% of mass in fine fraction. The diagrams for the southern sectors are similar for all three stations, supporting the hypothesis of a similar history of the air masses, presented on the basis of air trajectories. However, there are differences for individual elements within the same sector. For example the relative concentration of As at Birkenes in Fig. 31 is more than 10 times

higher than that at Virolahti. For the SW sector this difference is lower. Generally, the relative concentrations for the SW sector were highest at Rørvik and at Birkenes for the SE sector. This may suggest once again that long range transport of pollutants from Europe was an important contributor to the concentrations measured at all stations. It is difficult to conclude whether sources in Eastern or Western Europe were more pronounced, since an examination of the meteorological maps for the whole period of measurements indicates a mixture of air masses from Eastern and Western Europe at Birkenes and Rørvik (no trajectories available for Virolahti).

The diagrams for the northern sectors are also very interesting. Significantly higher concentrations at all stations were measured for Sn and Zn. The other elements behave very irregular when compared with the southern sectors. It is particularly evident for the NE sector. Very high concentrations of Zn, As and Sn at Rørvik and Cu, Ni, Zn, As, and Se at Birkenes may suggest a transport of pollutants from regions with nonferrous metal smelters located as far as on the Kola Peninsula. The NE concentrations at Virolahti are at the level observed for other sectors except Cr and Sn, the elements emitted from coal combustion.

The relative concentrations of elements that show the largest differences between sectorial concentrations are presented in Fig. 33. These elements include Cr, Cu, As, Se, Mo, and Sn. Since their concentrations are already related to the V concentration, they may serve as elemental tracers for the European aerosol measured in Scandinavia when considering the relative concentrations for sectors SE and SW. It should be noted that these tracers are built from average concentrations measured in the fine fraction of the particles, and represent the overall European aerosol. To distinguish between the East and West European aerosols affecting receptors in Scandinavia, only concentrations during episodes of long range transport from a given area can be considered. Based on the meteorological information (850 mb trajectories) and daily measurements at Birkenes and Rørvik, the elemental tracers were calculated for the East and West European aerosols, separately. The results are shown in Table 2.

From the data in Table 2, the difference between tracers for the West and East European aerosols is 2-3 fold which is not very large when considering uncertainties of tracer estimates. More pronounced is the difference between

these two groups of the tracers and tracers for the Moscow area and the Urals. Similar estimates of elemental tracers for the total concentrations resulted in even smaller differences between the East and West European aerosols, being at most 2 fold. This shows that the rather fine fraction of the particles should be considered for tracer estimates at locations in Scandinavia. The study on the origin of the Arctic aerosol (Ottar and Pacyna, 1984) indicates that it may not be valid for locations in the Arctic, where a majority of particles is in the fine mode.

The above discussion shows, that sector analysis may be an interesting technique to assess the contribution of different source areas to pollutant concentrations at receptors. However, it is necessary to use this technique together with information on the meteorological situation, particularly air mass trajectories, and properly assessed emission surveys.

The sectoral contributions of the element concentrations at Birkenes, Rörvik and Virolahti were related to the emissions within these sectors in Europe, published earlier (Pacyna, 1982). The data in Table 3 show the ratio of element concentration to element emission in given sectors relative to the concentration and emission of vanadium. This procedure involves the assumption that all the pollution components behave in the same way with respect to dry deposition and rain scavenging. Values less than one indicate that emissions have been overestimated relative to vanadium, higher values that emissions are underestimated. Generally, a good agreement has been obtained for S, Mn, Ni, Cu, As, Se and Pb, particularly for the southern sectors. The disagreement in some cases is likely due to an incomplete emission inventory, viz. disregard of natural sources (Mn, Zn and Se in the NW and NE sectors at Birkenes) and local emissions.

3 CONCLUSIONS

Trace metals from many sources in England, central Europe and the European part of the Soviet Union have been used to locate the emission areas for aerosols measured in Norway, Sweden and Finland. This requires accurate emission surveys, air mass trajectories and information on the physical-chemical processes taking place during the transport. Our results show that measured concentrations of trace elements from long range

transport at Birkenes, Rörvik and Virolahti can be related to calculated anthropogenic emissions for a number of elements, (e.g. V, Pb, Ni, Mn, Cu and As) for selected days with only slowly changing air trajectories. Vanadium, lead and cadmium seem to have their main emission sources in Western Europe, while arsenic, manganese, molybdenum and copper in Southern Scandinavia originate mainly from Eastern Europe.

The measurements performed in two fractions: fine and coarse made it possible to select a group of elements as tracers for the East European VS. West European aerosols measured at receptors in Scandinavia. The group includes: As, Cr, Cu, Mo, Se, Sn, and V measured in fine fraction of particles. Sector analysis has proved to be a useful technique to distinguish between emissions from local sources and long range transport of pollutants.

4 ACKNOWLEDGEMENTS

The sampling and chemical analysis for this project have been performed with support from the Nordic Ministerial Council (NMR) through the NMR Expert Group on Air Pollution Measurements. This institutions involved in the sampling in Sweden and Finland were Swedish Environmental Research Institute (IVL) and Finnish Meteorological Institute. The PIXE-analysis was carried out at Danish Air Pollution Laboratory.

5 REFERENCES

- Davidson, C.J. (1980) Dry deposition of cadmium from the atmosphere, In: Cadmium in the environment, ed. by J.O. Nriagu. N.Y., Wiley. pp. 115-40.
- Eliassen, A. and Saltbones, J. (1982) Modelling of long-range transport of sulphur over Europe: a two-year model run and some model experiments. Oslo, The Norwegian Meteorological Institute. (EMEP/MSC-W Report 1/82).
- Heidam, N.Z. (1981) Review: Aerosol fractionation by sequential filtration with Nuclepore filters, Atmos. Environ., 15, 891-905.

- Martinsson, B.G., Hansson, H.-C. and Lannefors, H.O. (1983) Southern Scandinavian aerosol composition and elemental size distribution characteristics dependent on air-mass history. In: Outdoor environmental studies using particle induced X-ray emission analysis. Doctoral thesis. By H.-C. Hansson. Lund University.
- NMR (1983) Air pollution measurement-experience and future perspectives of the NMR Expert Group 1975 - 83. Göteborg (Nordic Ministerial Council Report, 1983:5).
- Ottar, B. and Pacyna, J. M. (1984) Sources of Ni, Pb, and Zn during the Arctic episode in March 1983., Geophys. Res. Lett., 11, 441-444.
- Pacyna, J.M. (1982) Trace element emission from anthropogenic sources in Europe. Lillestrøm (NILU TR 10/82).
- Pacyna, J.M., Ottar, B., Tomza, U. and Maenhaut, W. (1985) Long-range transport of trace elements to Ny Alesund, Spitsbergen. Atmos. Environ., 19, 857-865.
- Pacyna, J.M., Semb, A. and Hanssen, J.E. (1984) Emission and long-range transport of trace elements in Europe. Tellus, 36B, 163-178.
- Rahn, K.A. (1981) The Mn/V ratio as a tracer of large-scale sources of pollution aerosol for the Arctic. Atmos. Environ., 15, 1457-1464.
- Statens naturvårdsverk. (1982) Monitor 1982. Tungmetaller och organiska miljögifter i svensk natur. Stockholm.
- Whitby, K.T. (1978) Physical characteristics of sulfur aerosols. Atmos. Environ., 12, 135-159.

Table 1: Norwegian fine mode (<2 μm) relative contributions (%) at Birkenes and Swedish fine mode relative contributions at Rörvik.

Element	Birkenes (This work)	Rörvik (This work)	Rörvik (Martinsson et al., 1983)
V	35	43	40
Mn	52	29	10
Ni	50	40	45
Zn	30	38	10
Pb	30	38	-
As	30	-	-
Cr	27	75	-
Cd	-	39	-

Table 2: Elemental ratios for the East and West European aerosol measured at Birkenes and Rörvik

Ratio* ¹	West European* ²	East European* ³	Moscow + Urals
Cr/V	0.23 - 0.37 0.30	0.12 - 0.17 0.14	0.5 - 0.8 0.70
Cu/V	0.70 - 1.10 0.92	0.07 - 0.20 0.13	1.2 - 1.4 1.1
As/V	0.80 - 1.10 0.91	0.15 - 0.37 0.28	3.4 - 4.1 3.8
Se/V	0.13 - 0.28 0.15	0.02 - 0.07 0.04	0.11 - 0.16 0.14
Mo/V	0.12 - 0.13 0.12	0.03 - 0.07 0.05	0.10 - 0.15 0.14
Sn/V	0.54 - 0.70 0.62	0.24 - 0.27 0.25	0.80 - 1.20 1.00

*¹ based on concentrations in fine fraction of particles

*² including the United Kingdom

*³ including the Western USSR

Table 3: Comparison of measured mean concentrations with expected values using vanadium as reference elements (see text for explanation).

Metal	S	Mn	Ni	Cu	Zn	As	Se	Pb	Cr
Station sector									
Birkenes									
NW	1.8	14.0	4.5	1.0	0.9	2.6	19	1.7	0.8
NE	1.1	23.0	4.1	4.1	15.0	3.7	3.3	6.4	0.8
SE	0.5	2.5	1.2	1.5	6.2	4.9	1.5	3.4	0.4
SW	1.0	2.8	1.7	1.3	3.9	2.6	3.4	2.0	0.3
Rørvik									
NW	0.9	1.8	1.3	0.7	3.5	1.0	3.5	1.9	0.3
NE	0.3	2.2	1.1	1.9	7.7	12.0	1.0	2.9	1.1
SE	0.2	1.1	0.9	0.6	3.0	1.7	0.6	1.6	0.1
SW	0.7	2.0	1.3	1.6	6.3	4.8	3.0	3.0	0.3
Violahti									
NW	0.8	1.5	1.3	0.6	2.4	1.1	0.8	2.5	0.4
NE	0.2	4.2	1.0	1.0	7.0	1.6	0.2	2.2	0.7
SE	0.2	1.5	1.0	0.7	3.7	0.7	0.5	1.3	0.3
SW	0.4	1.4	1.1	0.7	1.8	0.7	0.7	1.0	0.1

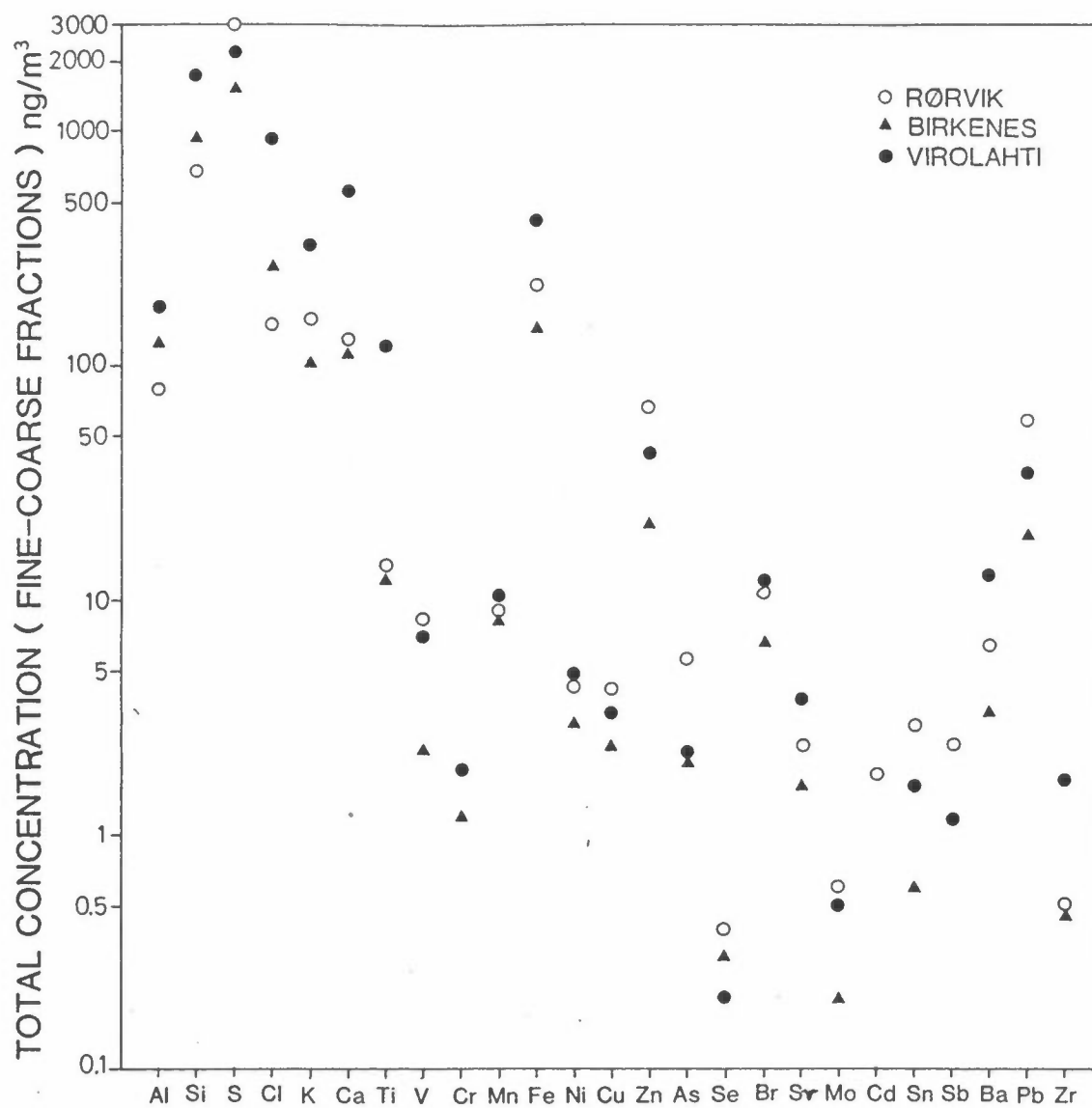


Fig. 1. The average concentrations of trace elements at Rørvik (○), Birkenes (▲), and Virolahti (●), measured in the period February - June 1980.

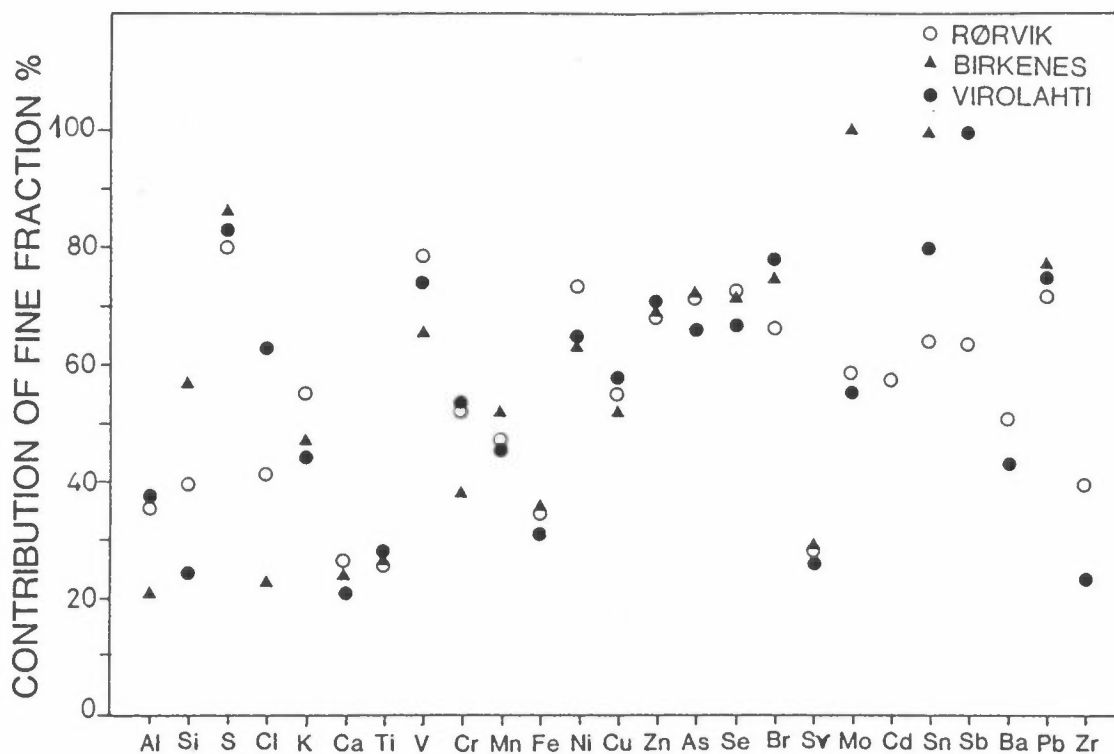


Fig. 2. The contribution of the trace element concentrations in fine fraction of particles measured at Rørvik (o), Birkenes (Δ), and Virolahti (\bullet).

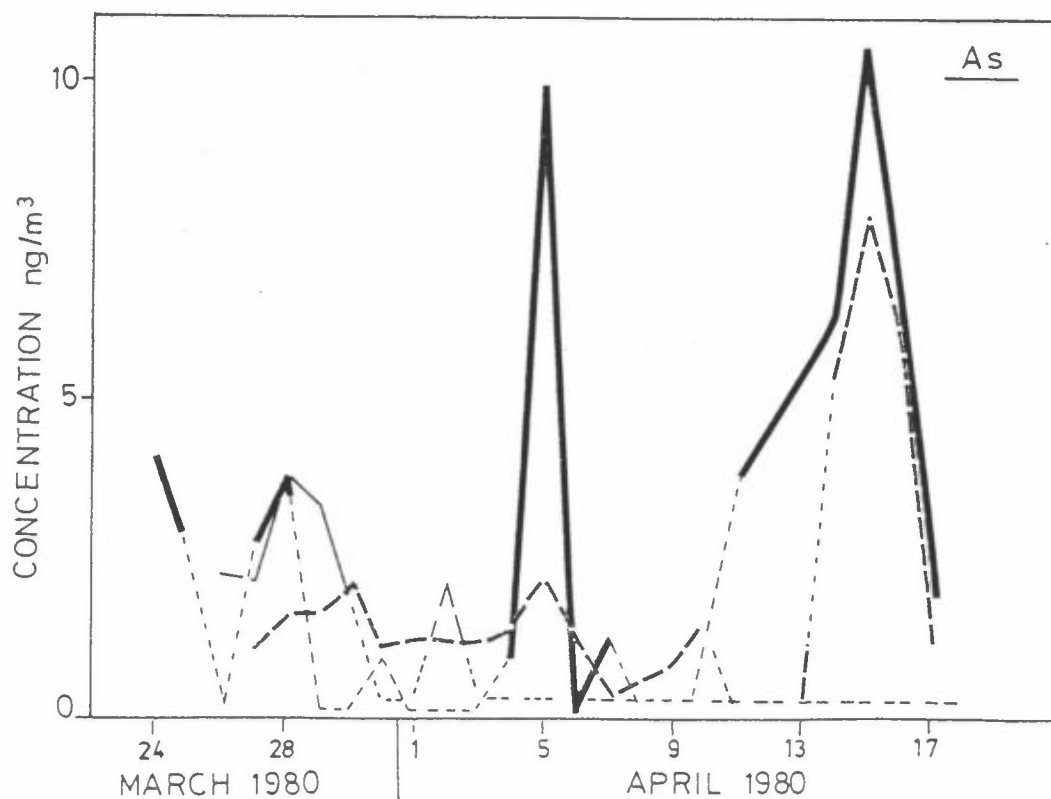


Fig. 3. The As concentrations in fine fraction of particles measured at Rørvik (thick solid line), Virolahti (thin solid line), and Birkenes (broken line).

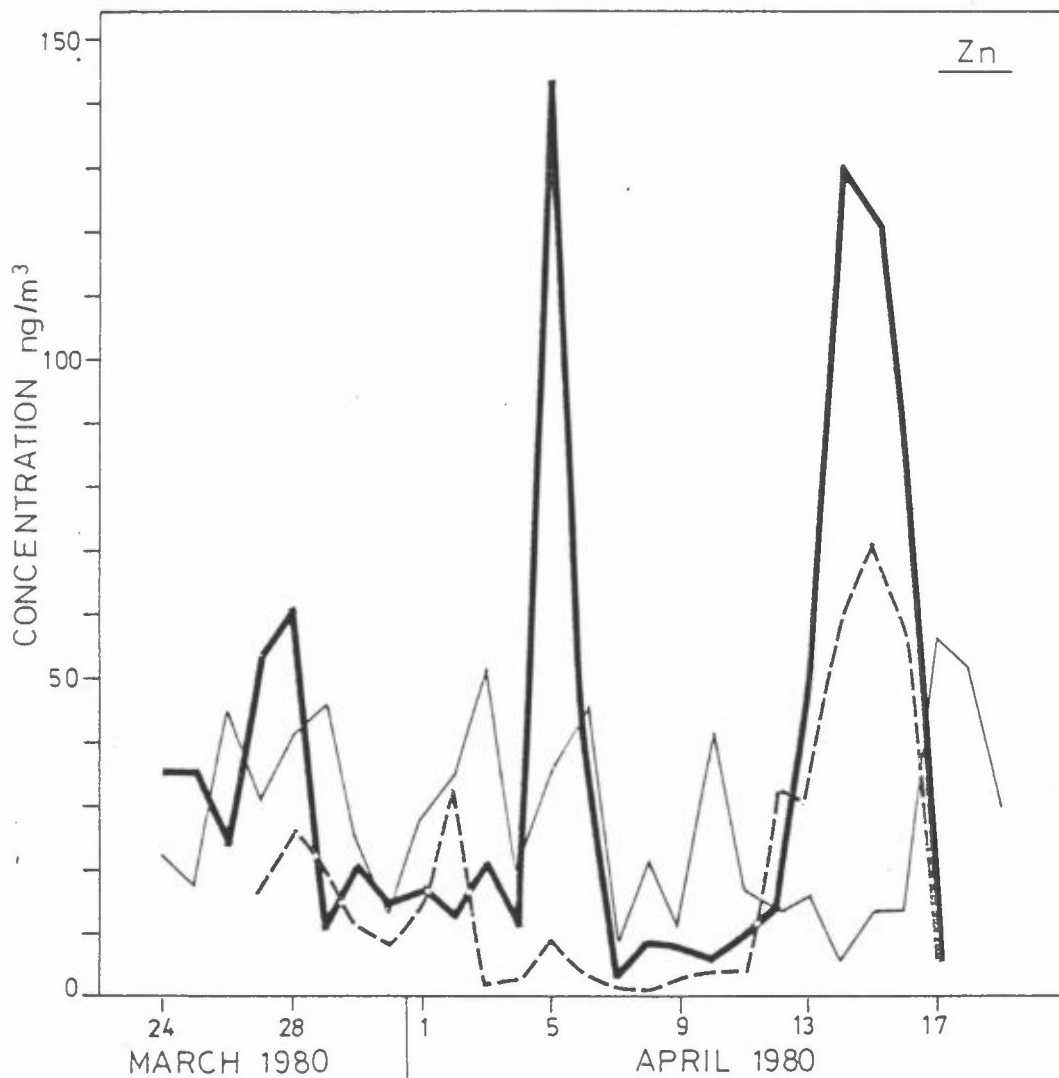


Fig. 4. The Zn concentrations in fine fraction of particles at Rörvik, Virolahti and Birkenes. Designation as in Fig. 3.

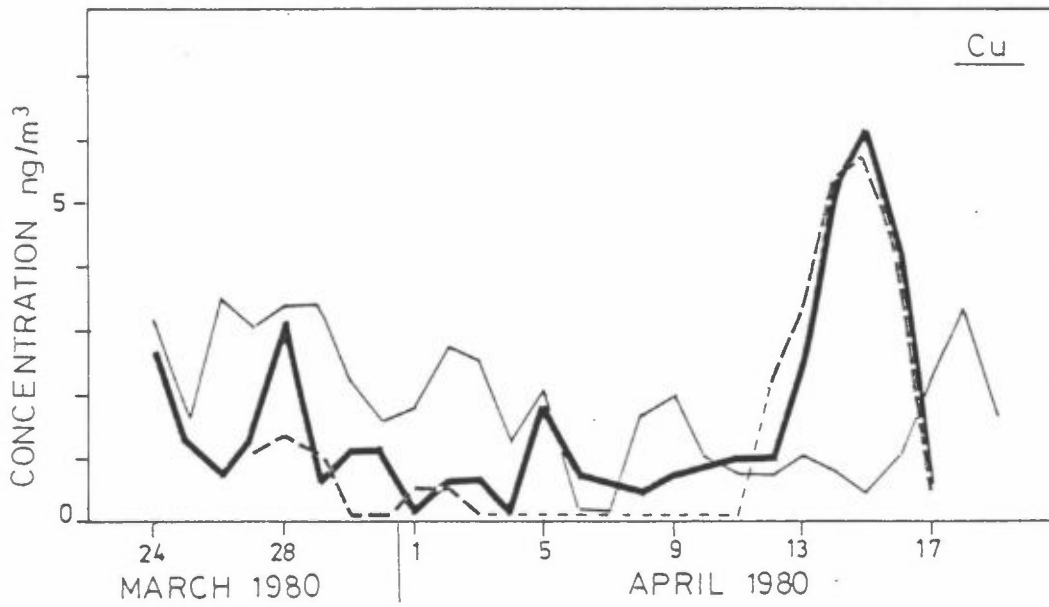


Fig. 5. The Cu concentrations in fine fraction of particles at Rörvik, Virolahti and Birkenes. Designation as in Fig. 3.

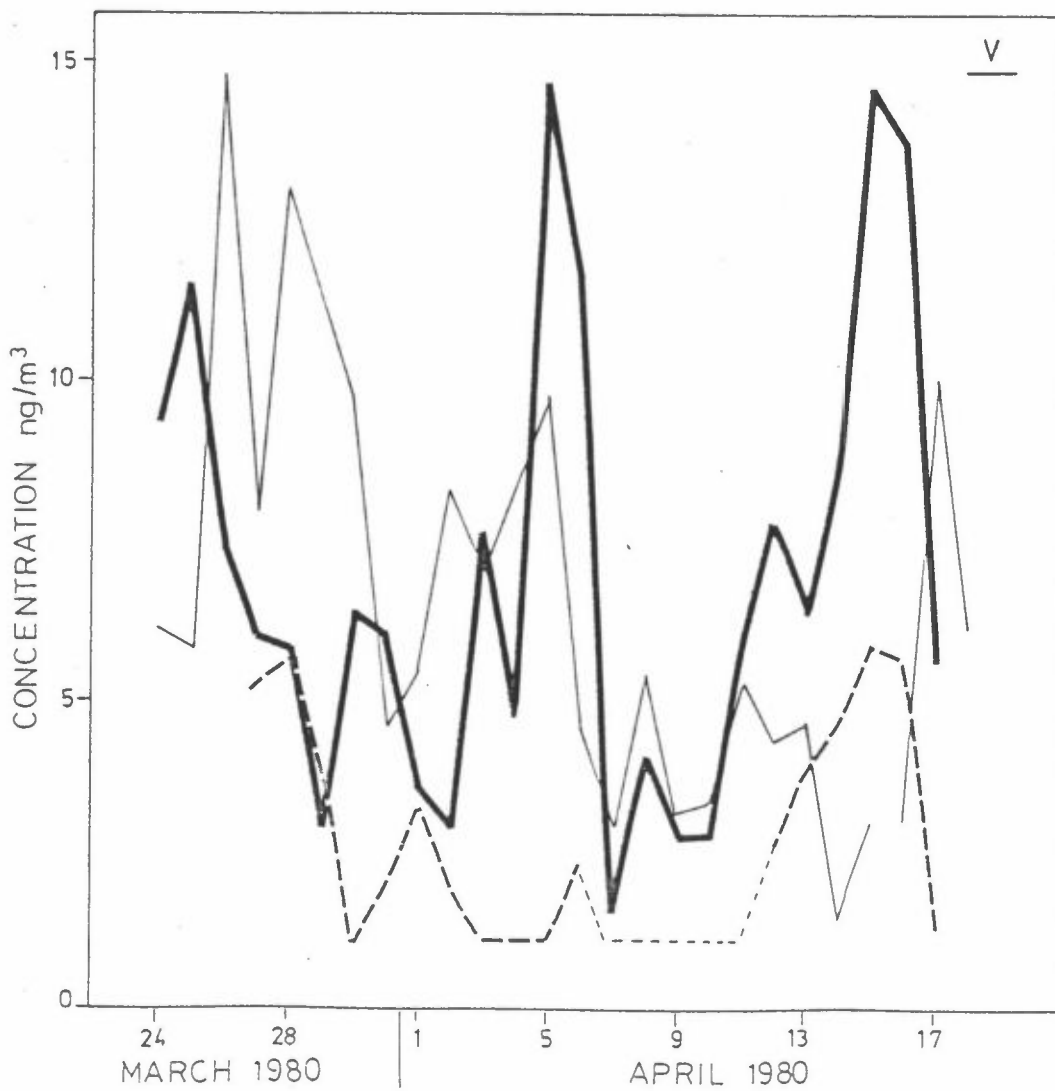


Fig. 6. The V concentrations in fine fraction of particles at Rörvik, Virolahti and Birkenes. Designation as in Fig. 3.

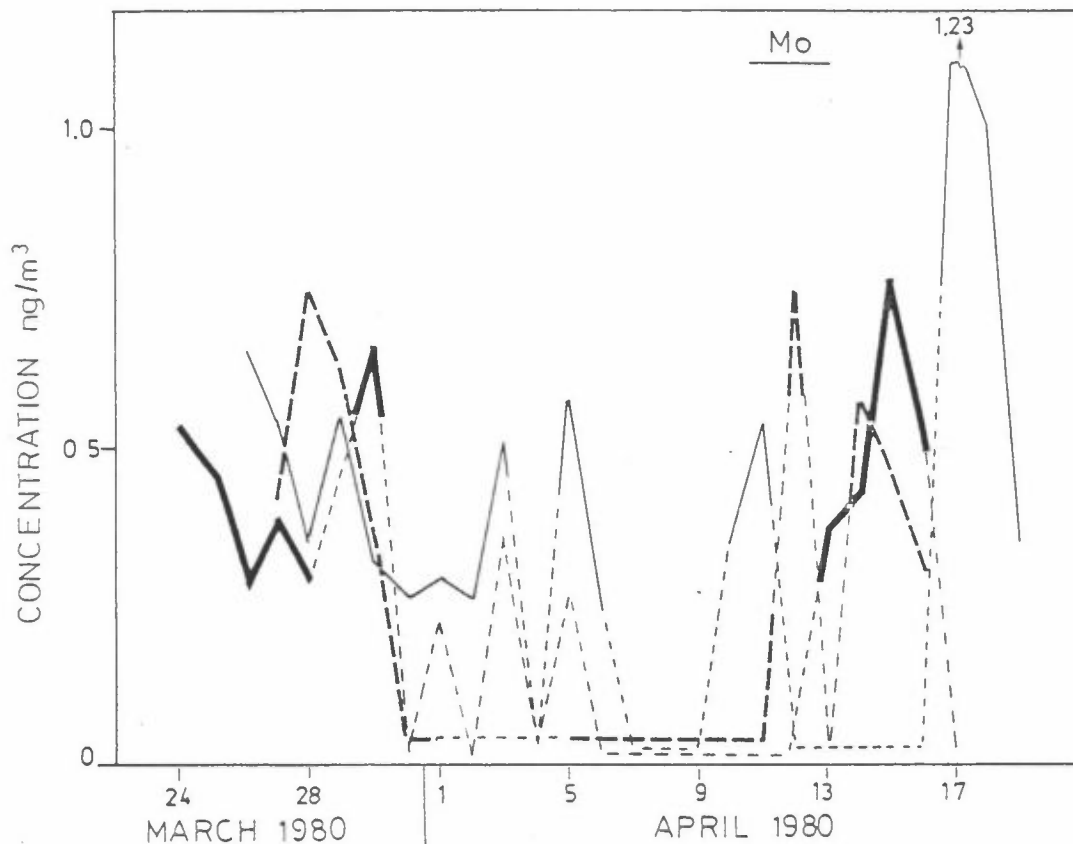


Fig. 7. The Mo concentrations in fine fractions of particles at Rörvik, Virolahti and Birknes. Designation as in Fig. 3.

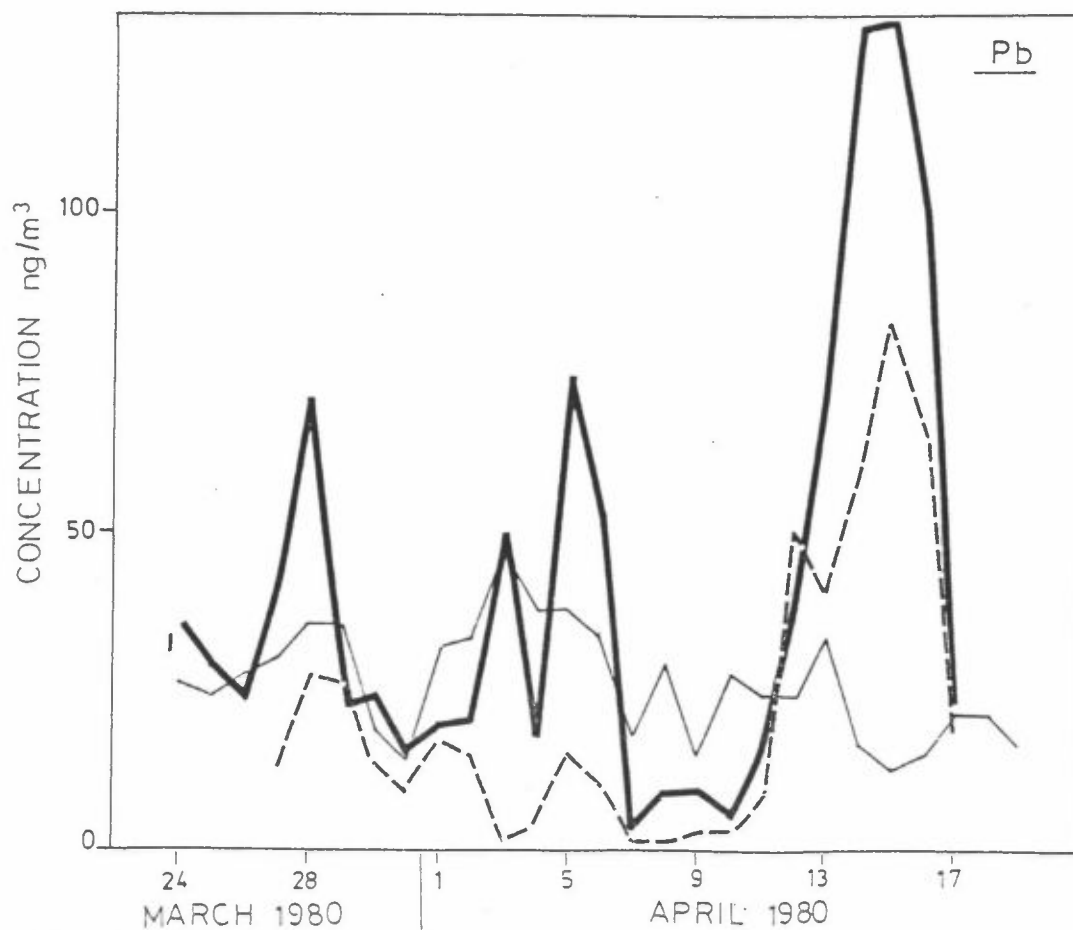


Fig. 8. The Pb concentrations in fine fraction of particles at Rörvik, Virolahti and Birknes. Designation as in Fig. 3.

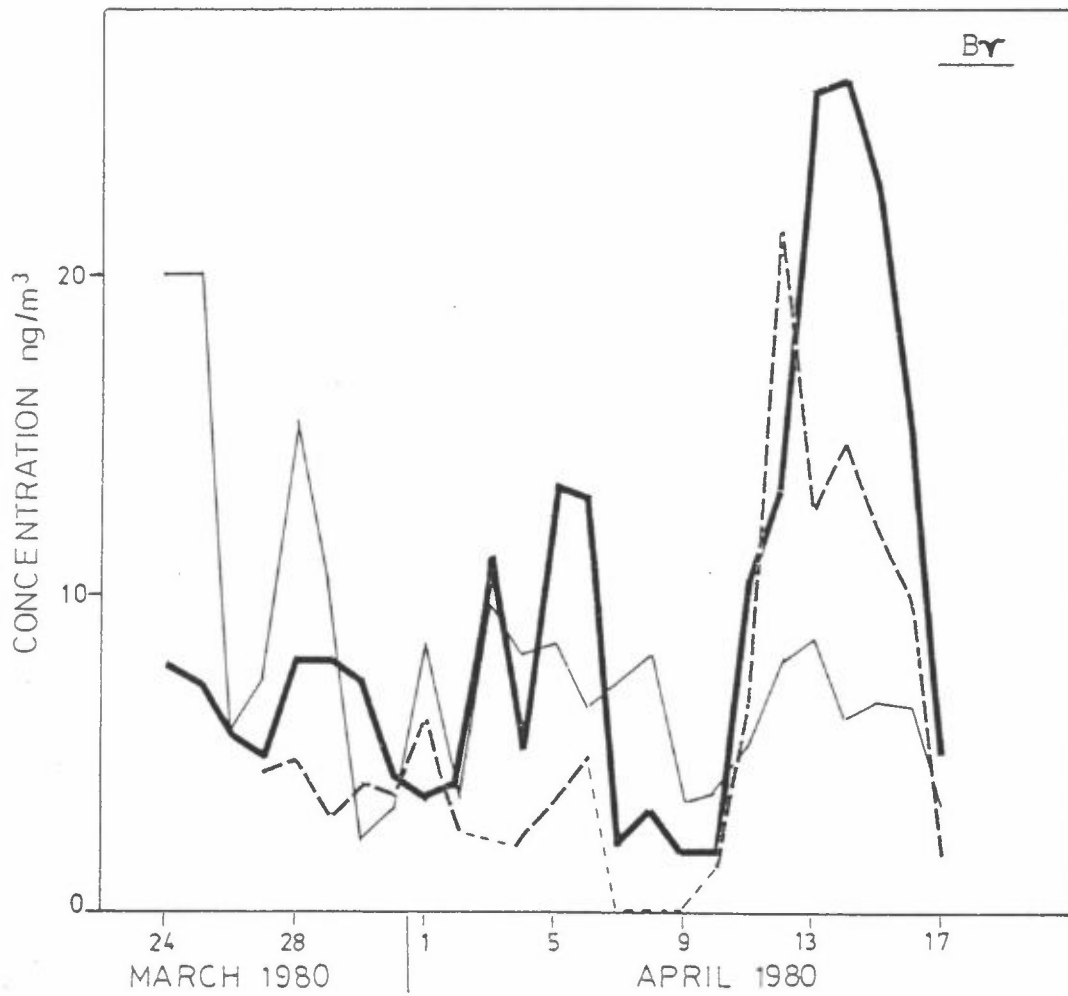


Fig. 9. The Br concentrations in fine fraction of particles at Rörvik, Virolhahti and Birkenes. Designation as in Fig. 3.

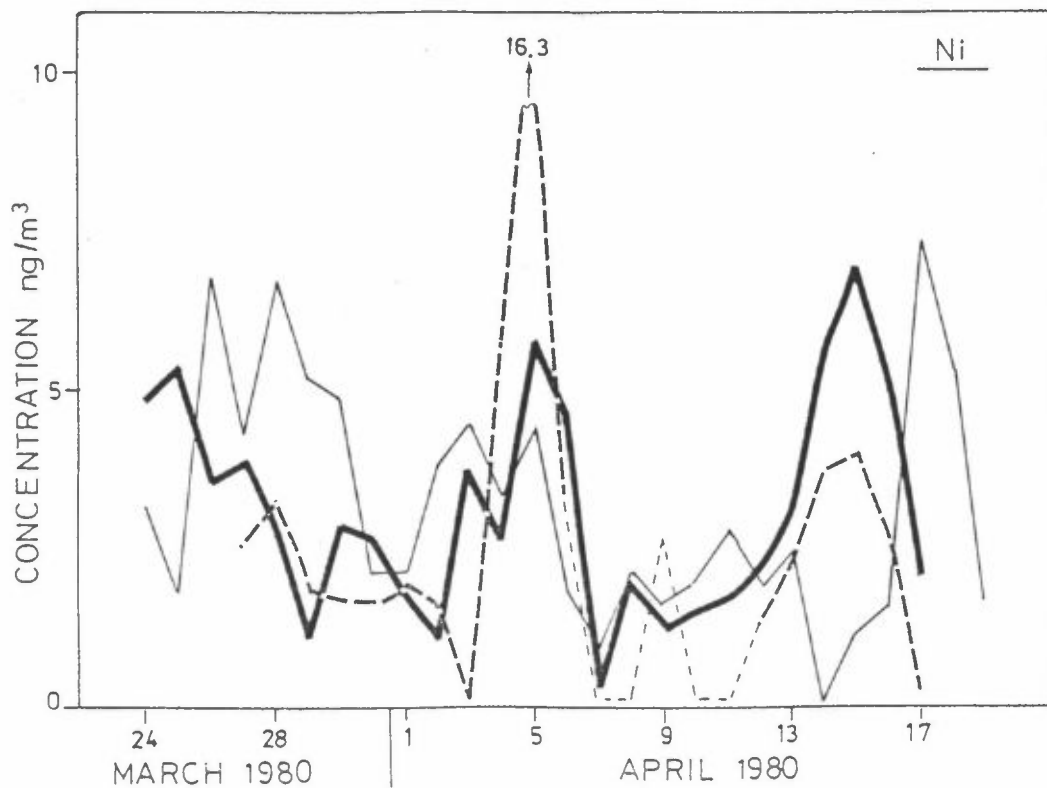


Fig. 10. The Ni concentrations in fine fraction of particles at Rörvik, Virolahti and Birkenes. Designation as in Fig. 3.

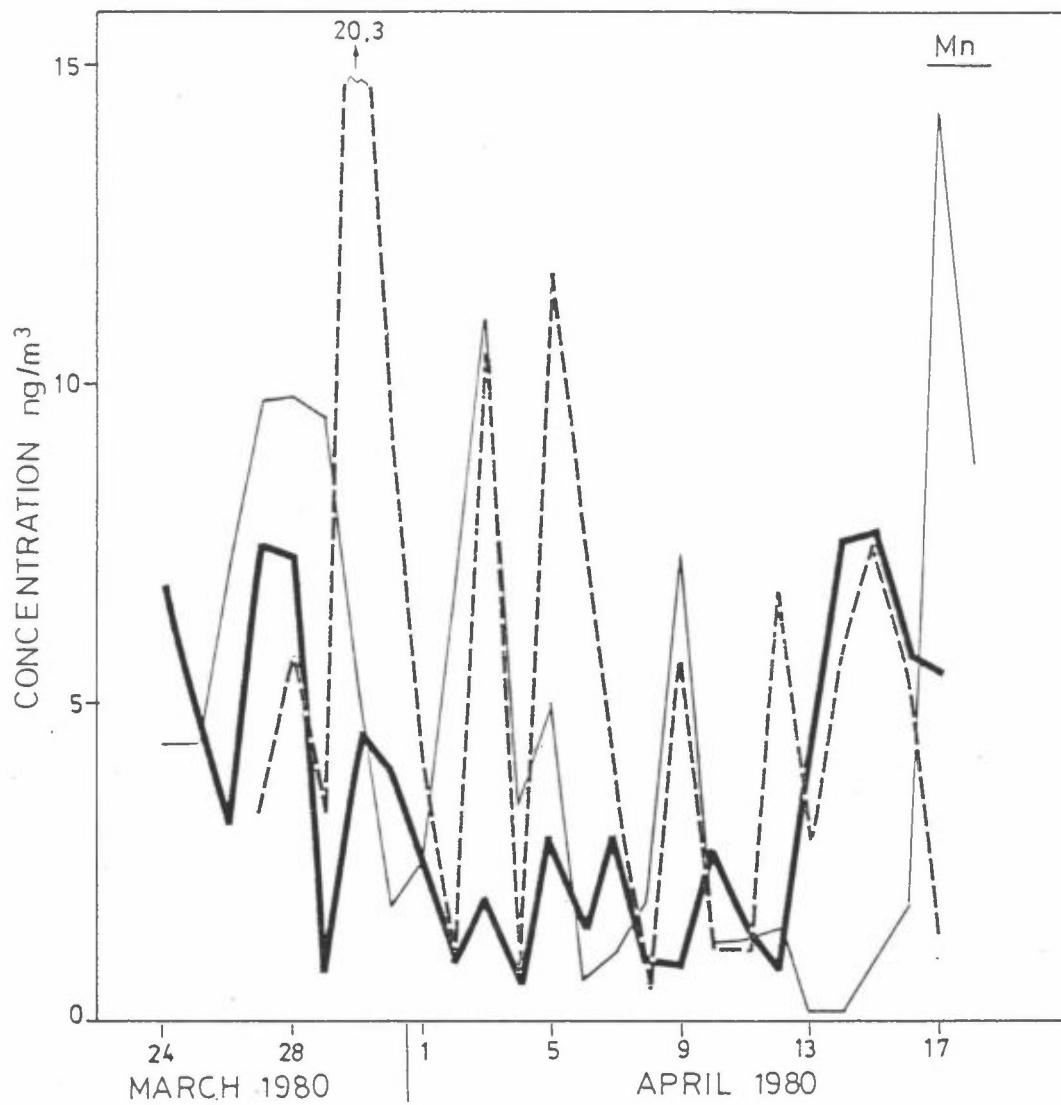


Fig. 11. The Mn concentrations in fine fraction of particles at Rörvik, Virolahti and Birkenes. Designation as in Fig. 3.

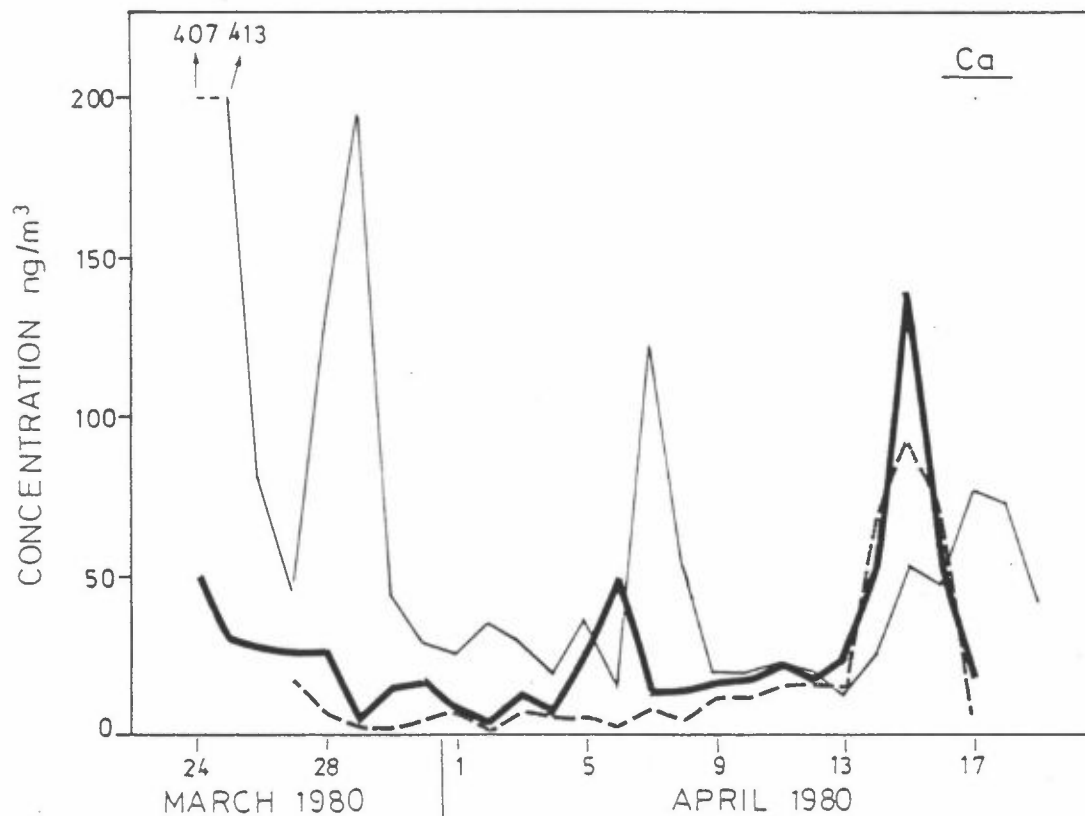


Fig. 12. The Ca concentrations in fine fraction of particles at Rörvik, Virolahti and Birkenes. Designation as in Fig. 3.

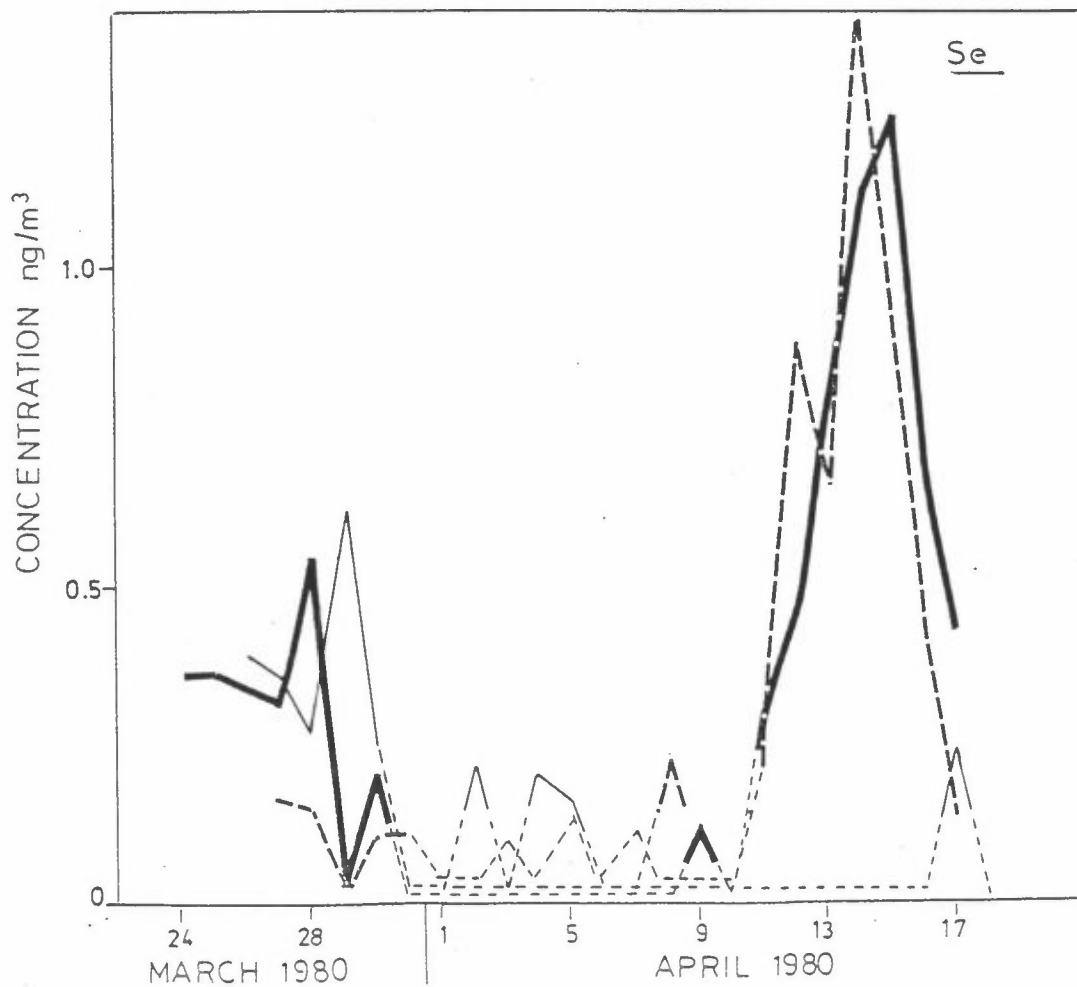


Fig. 13. The Se concentrations in fine fraction of particles at Rörvik, Virolahti and Birkenes. Designation as in Fig. 3.

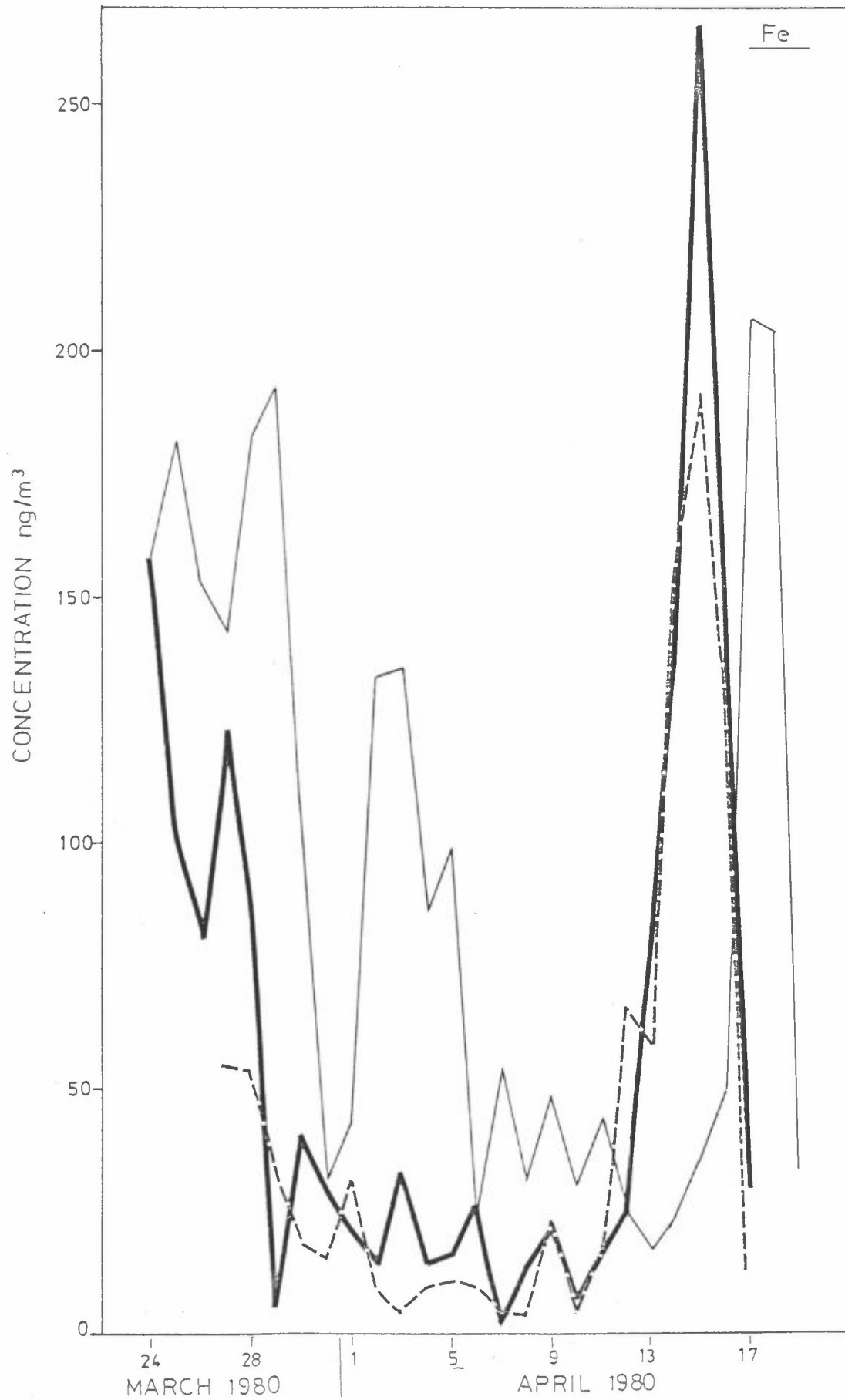


Fig. 14. The Fe concentrations in fine fraction of particles at Rörvik, Virolahti and Birkenes. Designation as in Fig. 3.

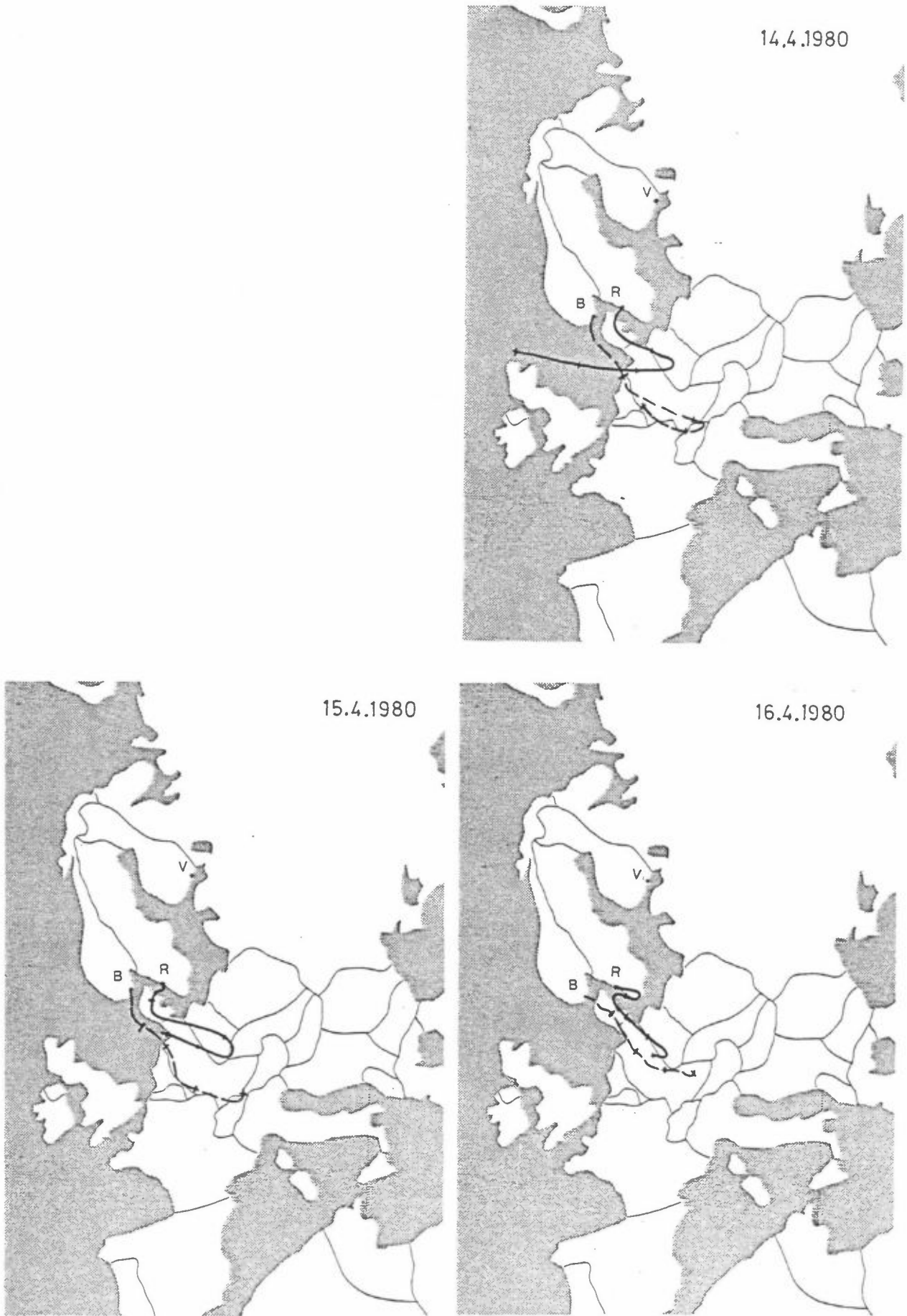


Fig. 15. Daily 850 mb trajectories for Birkenes and Rörvik during the period 14-16 April 1980.

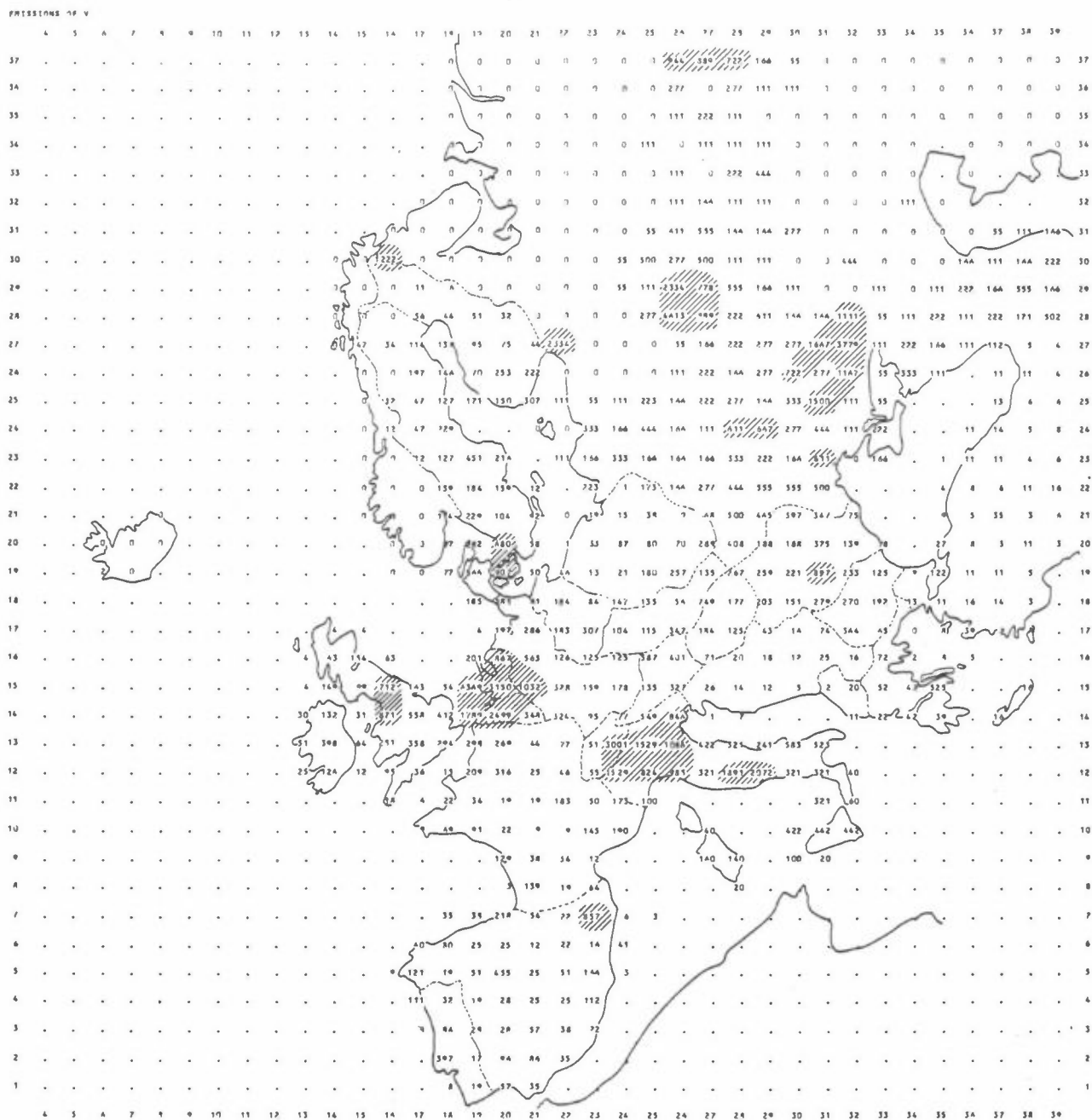


Fig. 16. Spatial distribution of vanadium emission in Europe in 1979 in 10^2 kg/year. The shaded areas represent locations with emissions higher than the average for the grid area.

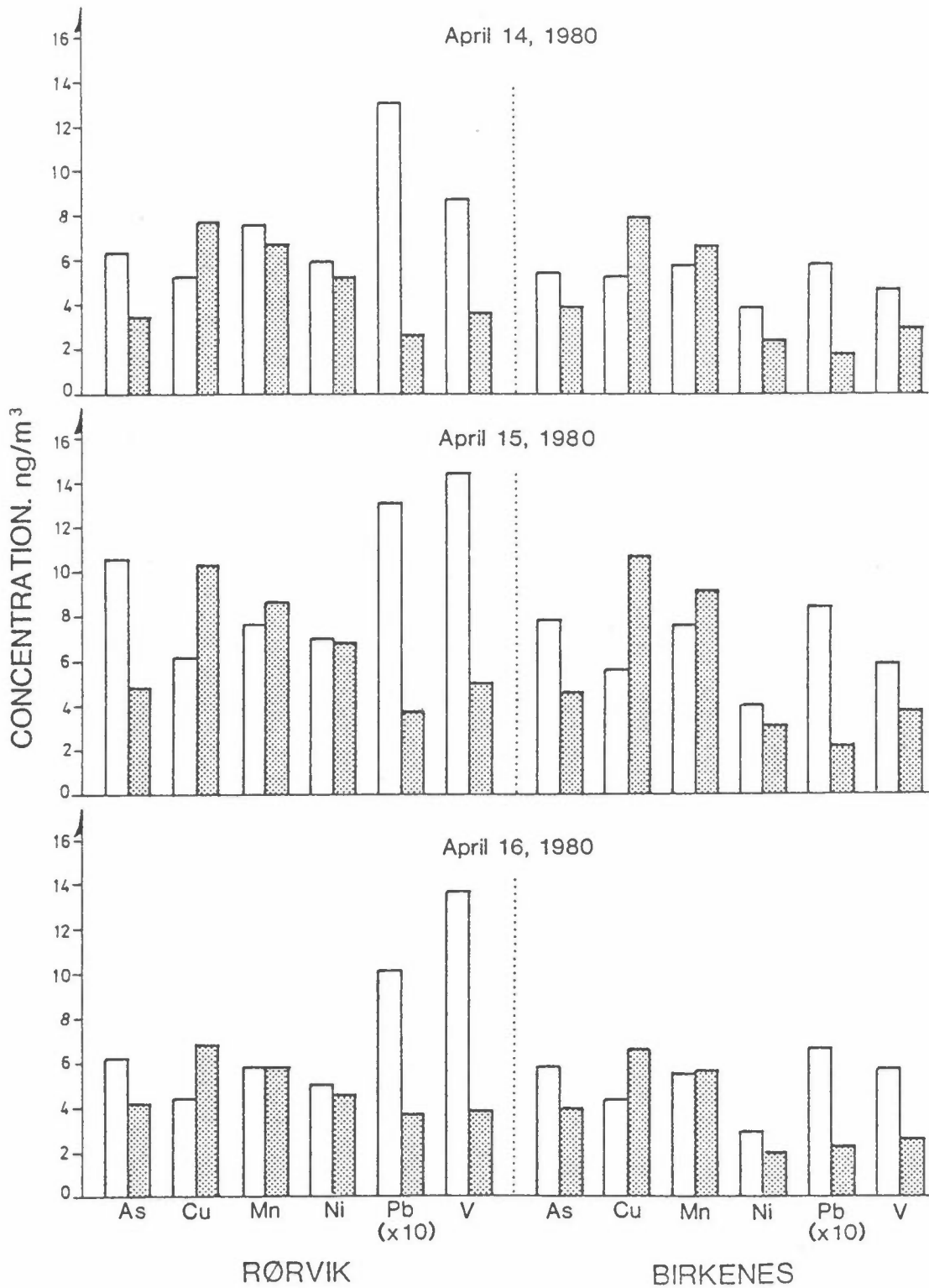


Fig. 17. The measured (open bars) and calculated concentrations of trace elements (full bars) at Birkenes and Rørvik in April 1980.

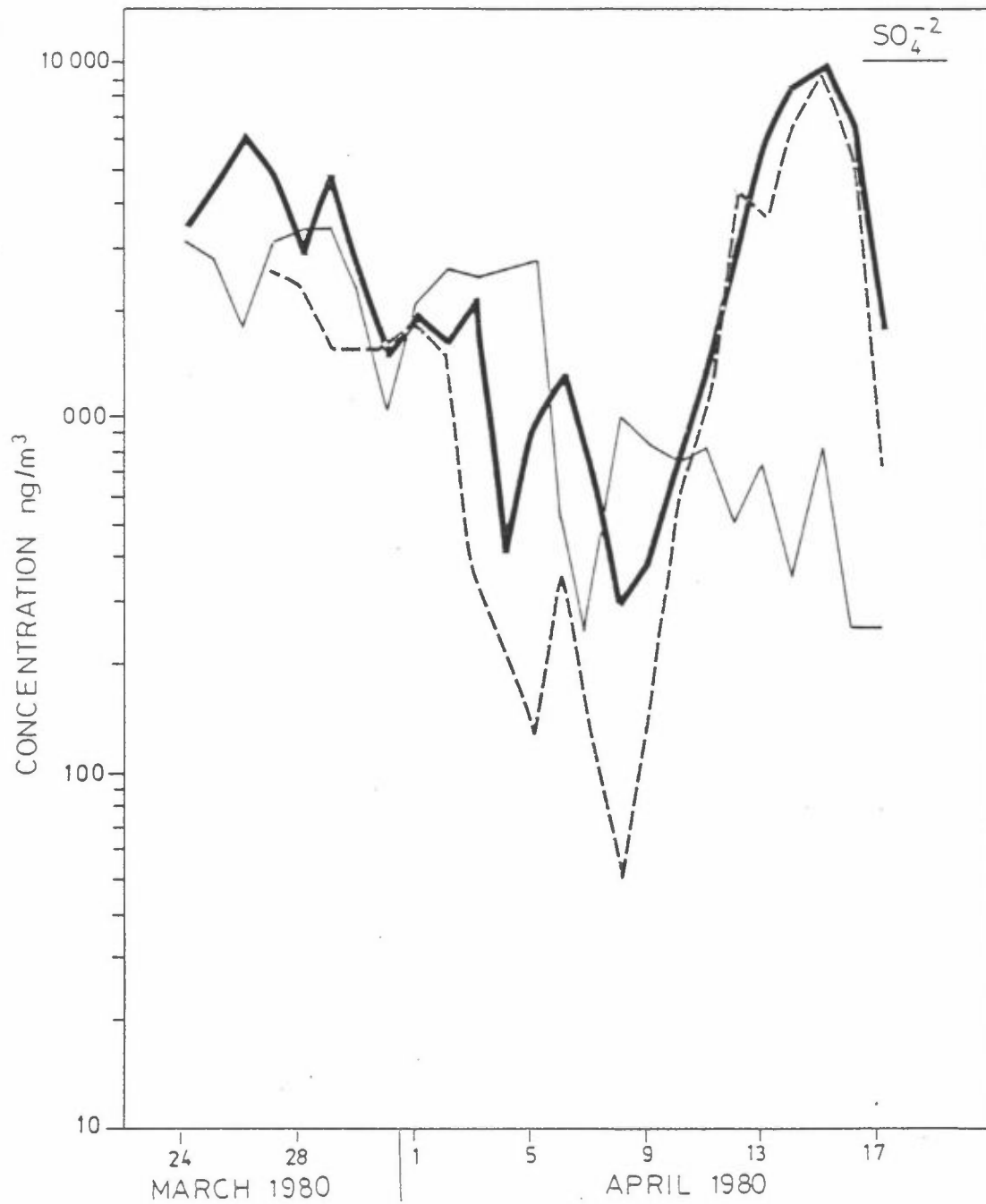


Fig. 18. The SO_4^{2-} concentrations in fine fraction of particles at Rörvik, Virolanti and Birkenes. Designation as in Fig. 3.

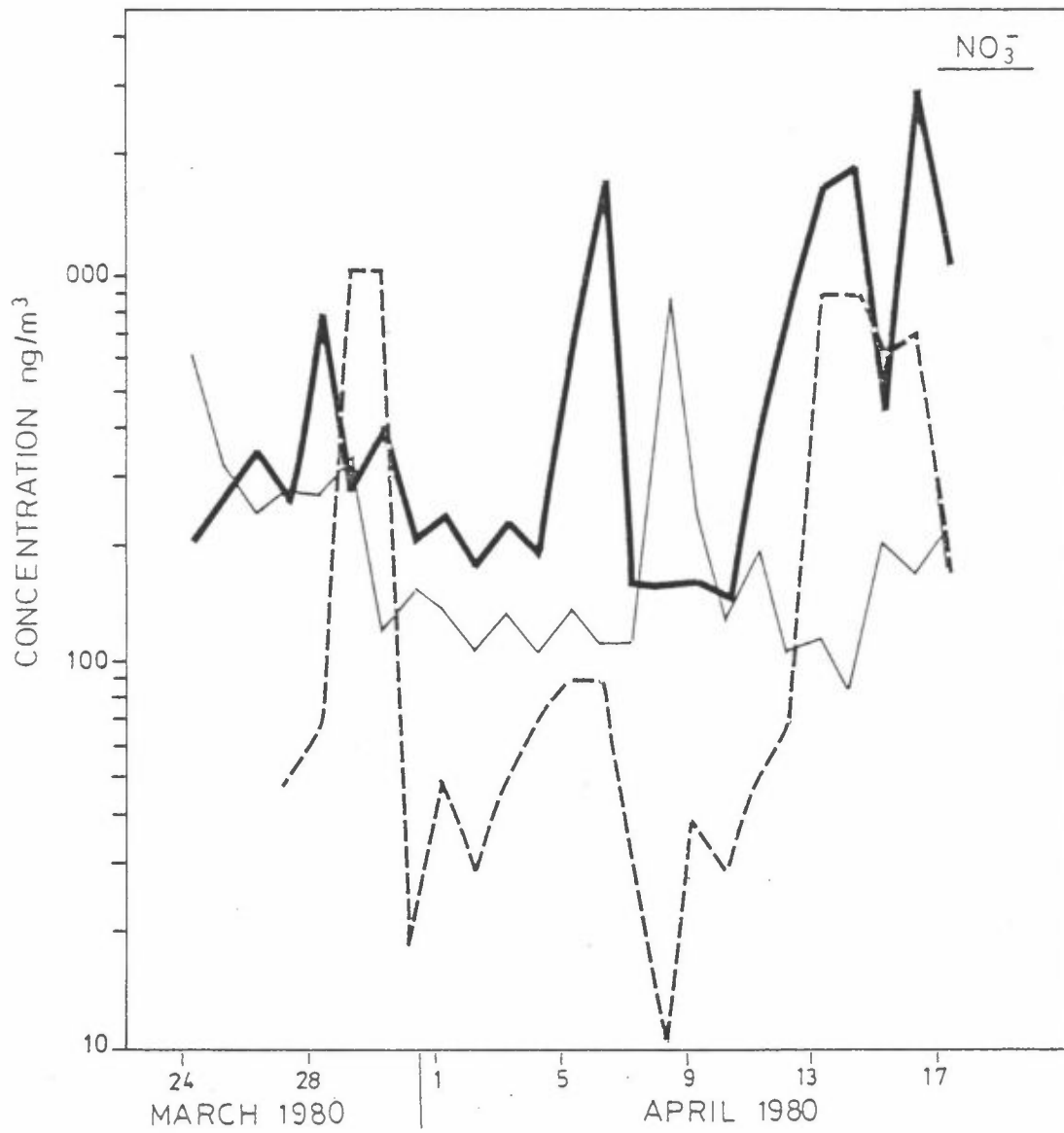


Fig. 19. The NO_3^- concentrations in fine fraction of particles at Rörvik, Virolahti and Birkenes. Designation as in Fig. 3.

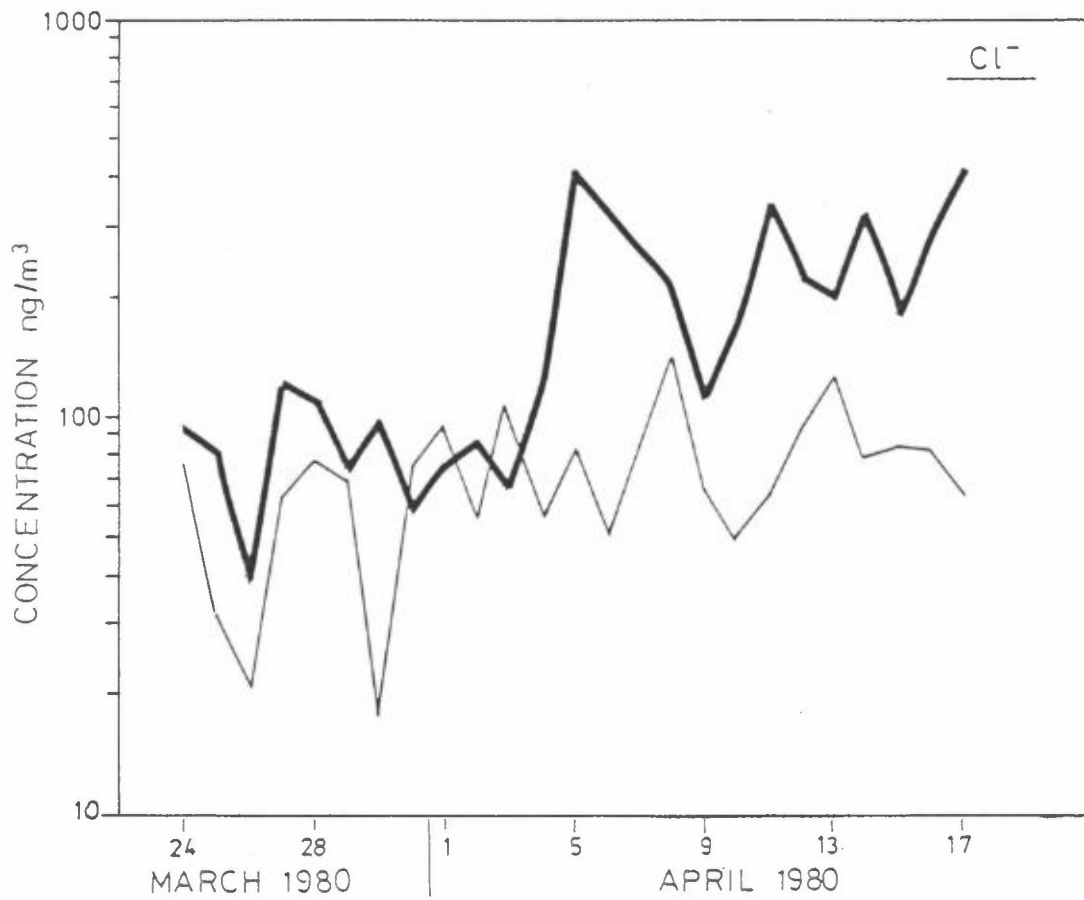


Fig. 20. The Cl⁻ concentrations in fine fraction of particles at Rörvik, Virolahti and Birkenes. Designation as in Fig. 3.



Fig. 21. Daily 850 mb trajectories for Birkenes and Rörvik on 5 April, 1980.

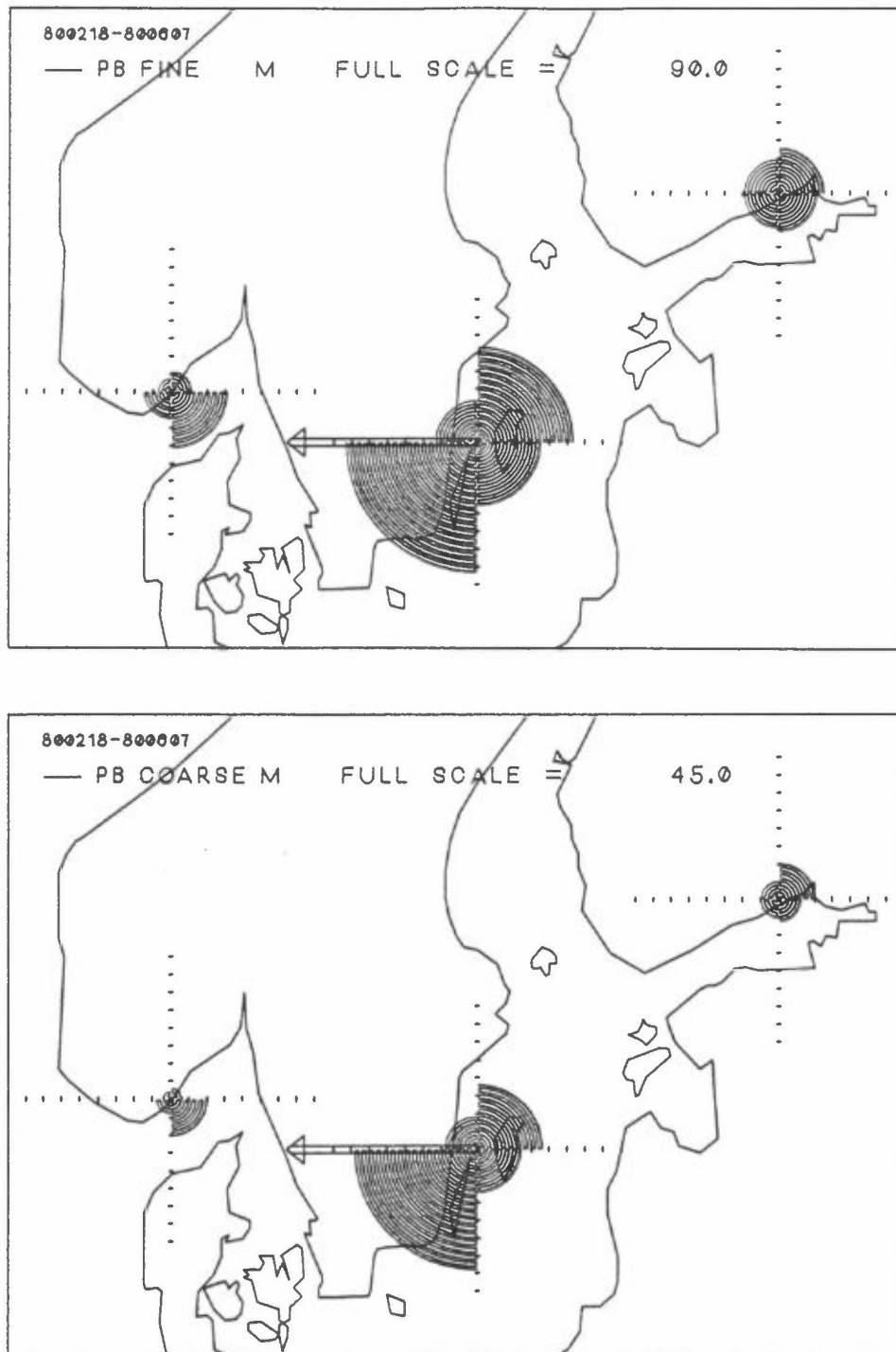


Fig. 22. The sectoral concentrations of Pb in fine and coarse fractions of particles at Rörvik, Virolahti and Birkenes.

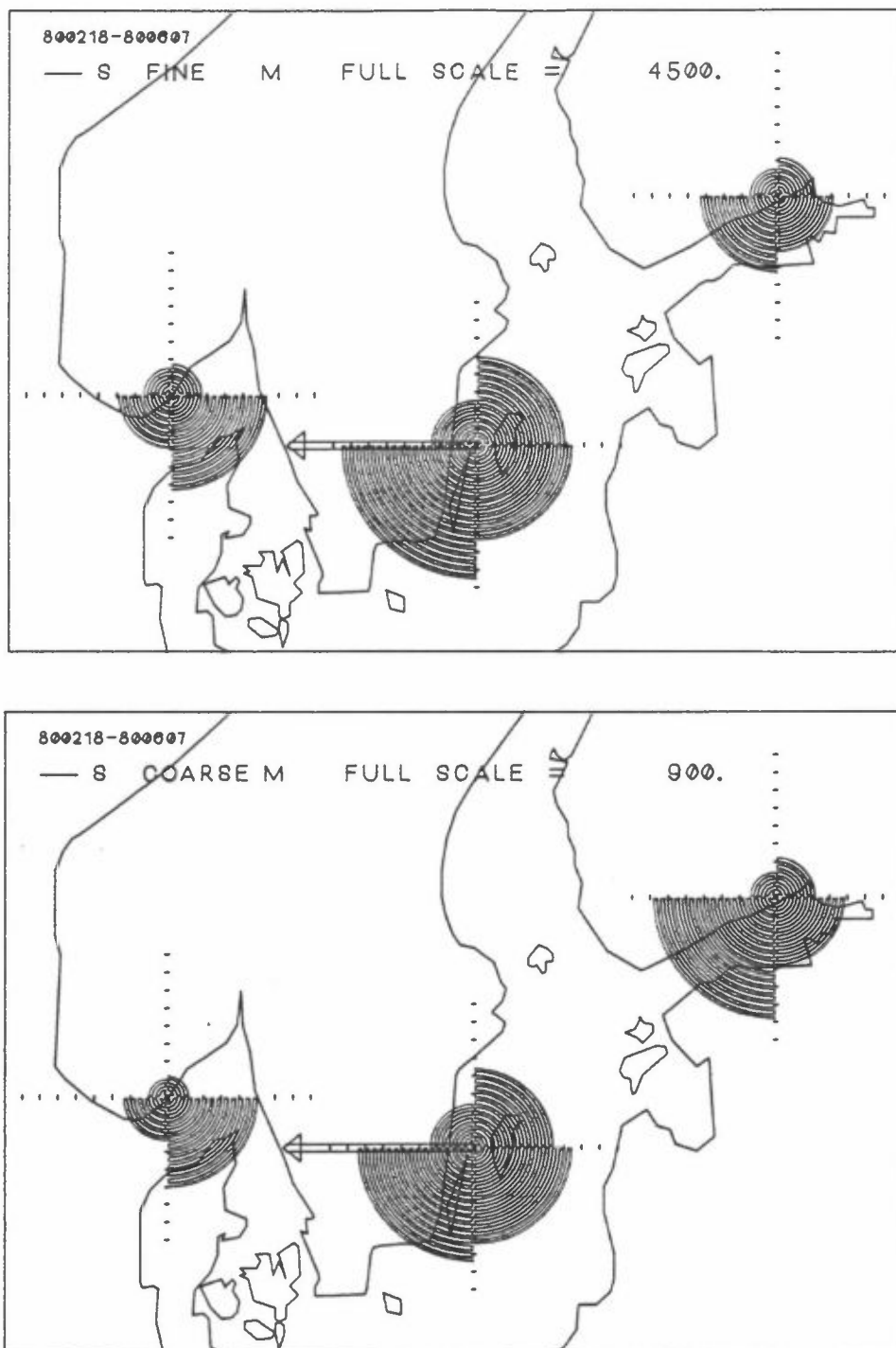


Fig. 23. The sectoral concentrations of S in fine and coarse fractions of particles at Rörvik, Virolahti and Birkenes.

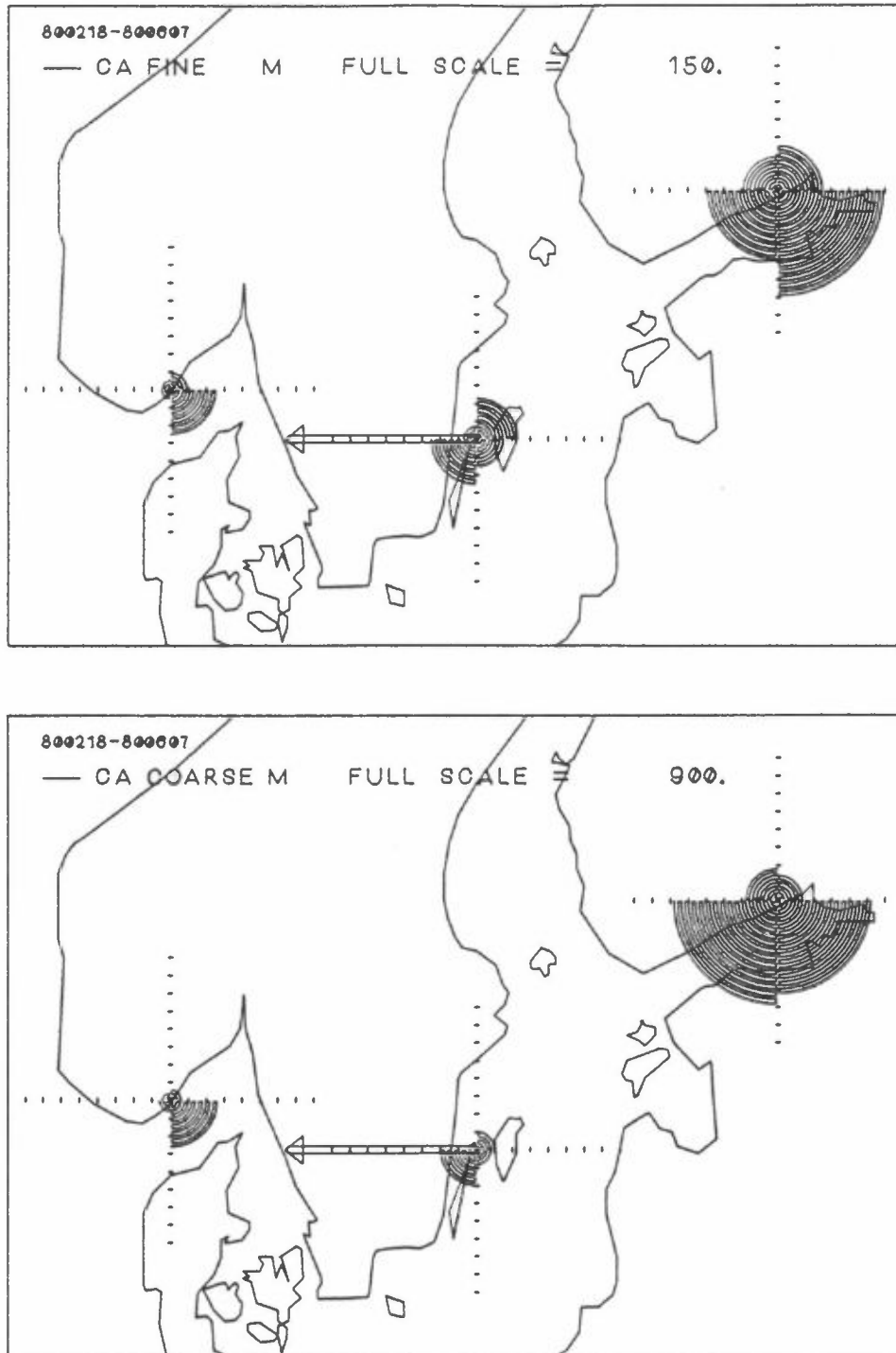


Fig. 24. The sectoral concentrations of Ca in fine and coarse fractions of particles at Rörvik, Virolahti and Birkenes.

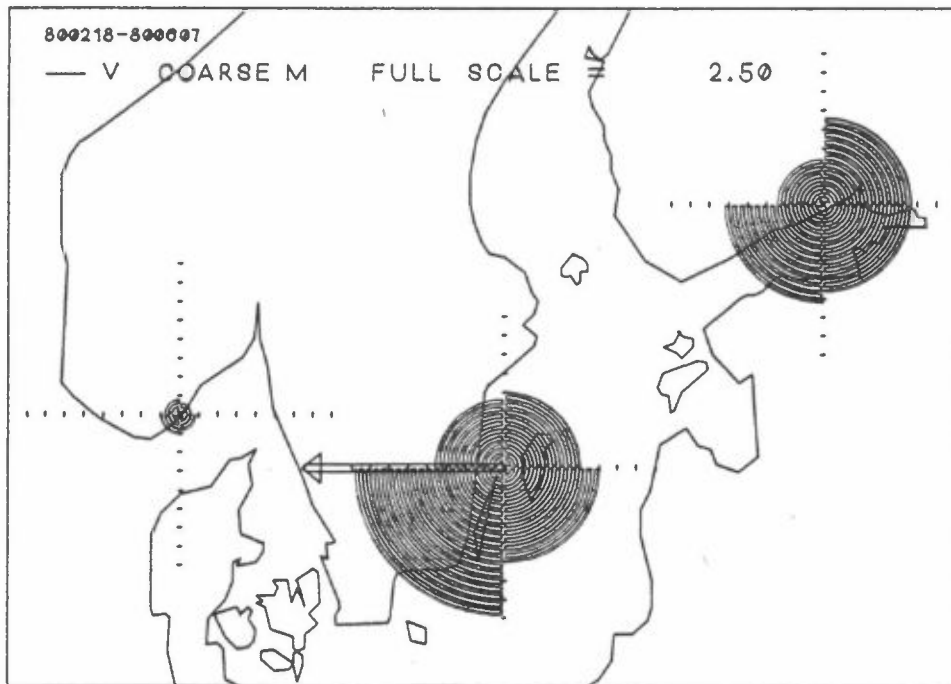
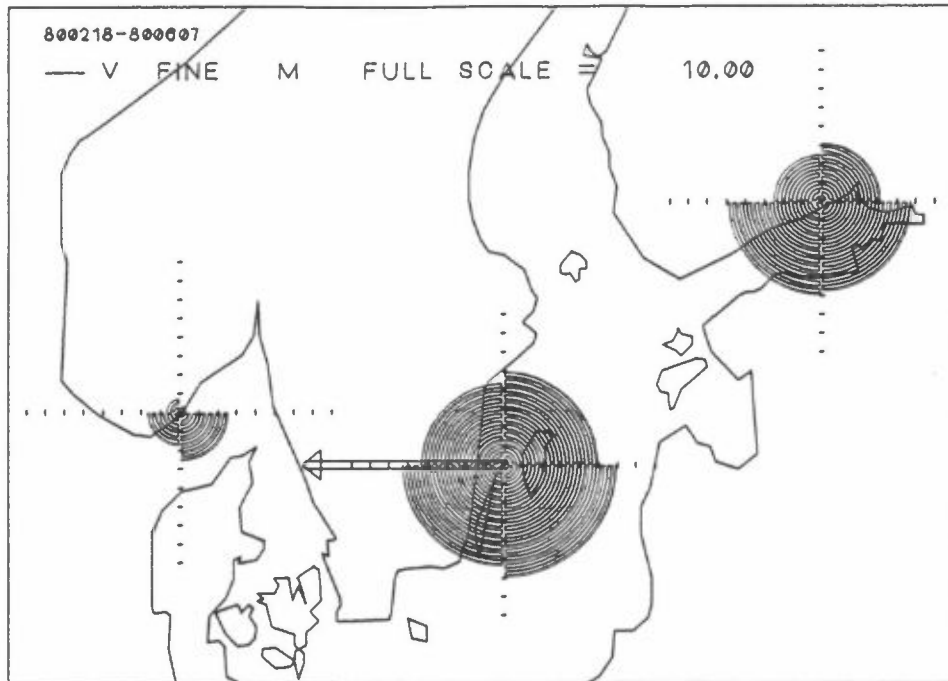


Fig. 25. The sectoral concentrations of V in fine and coarse fractions of particles at Rörvik, Virolahti and Birkenes.

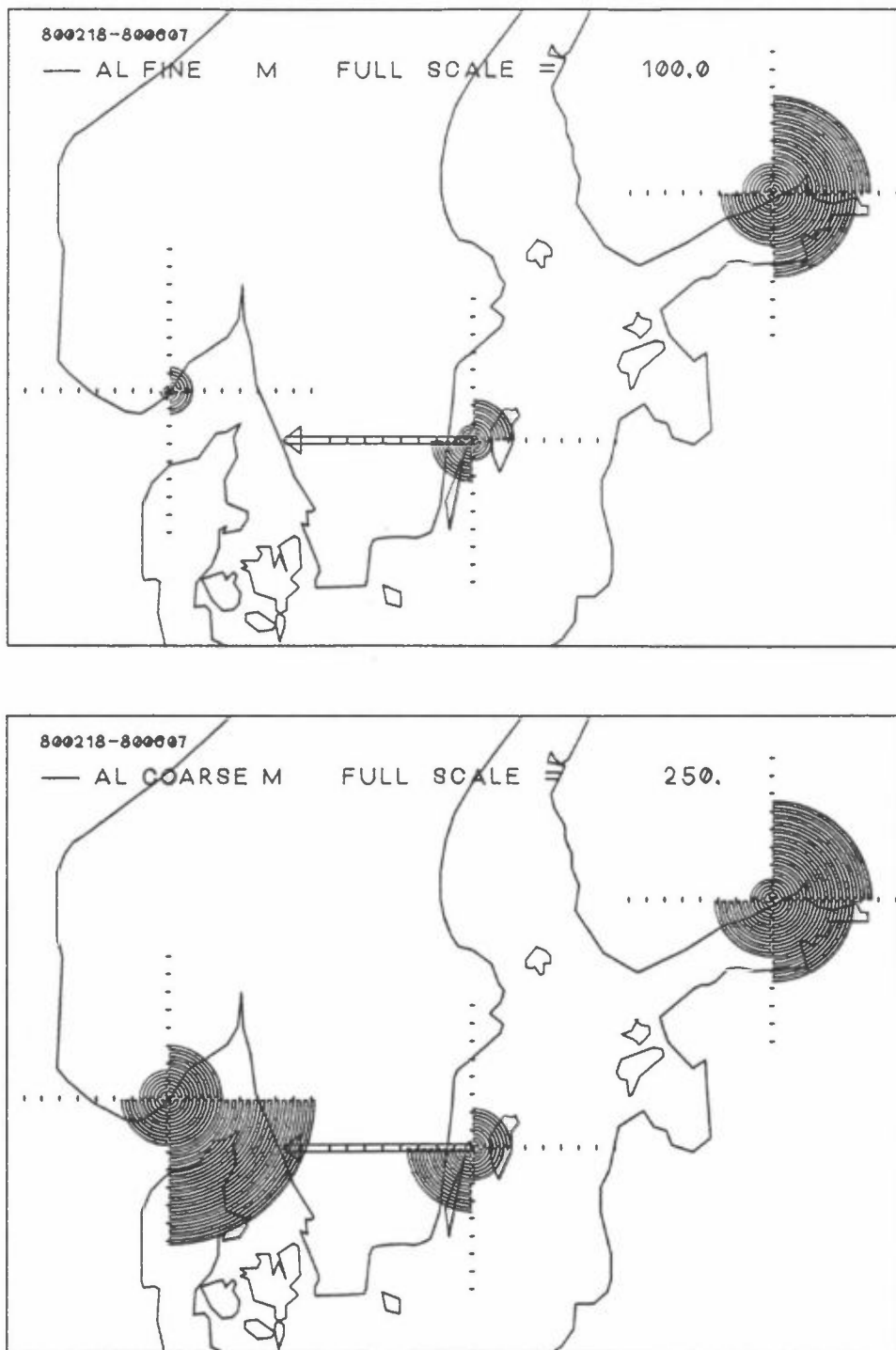


Fig. 26. The sectoral concentrations of Al in fine and coarse fractions of particles at Rörvik, Virolahti and Birkenes.

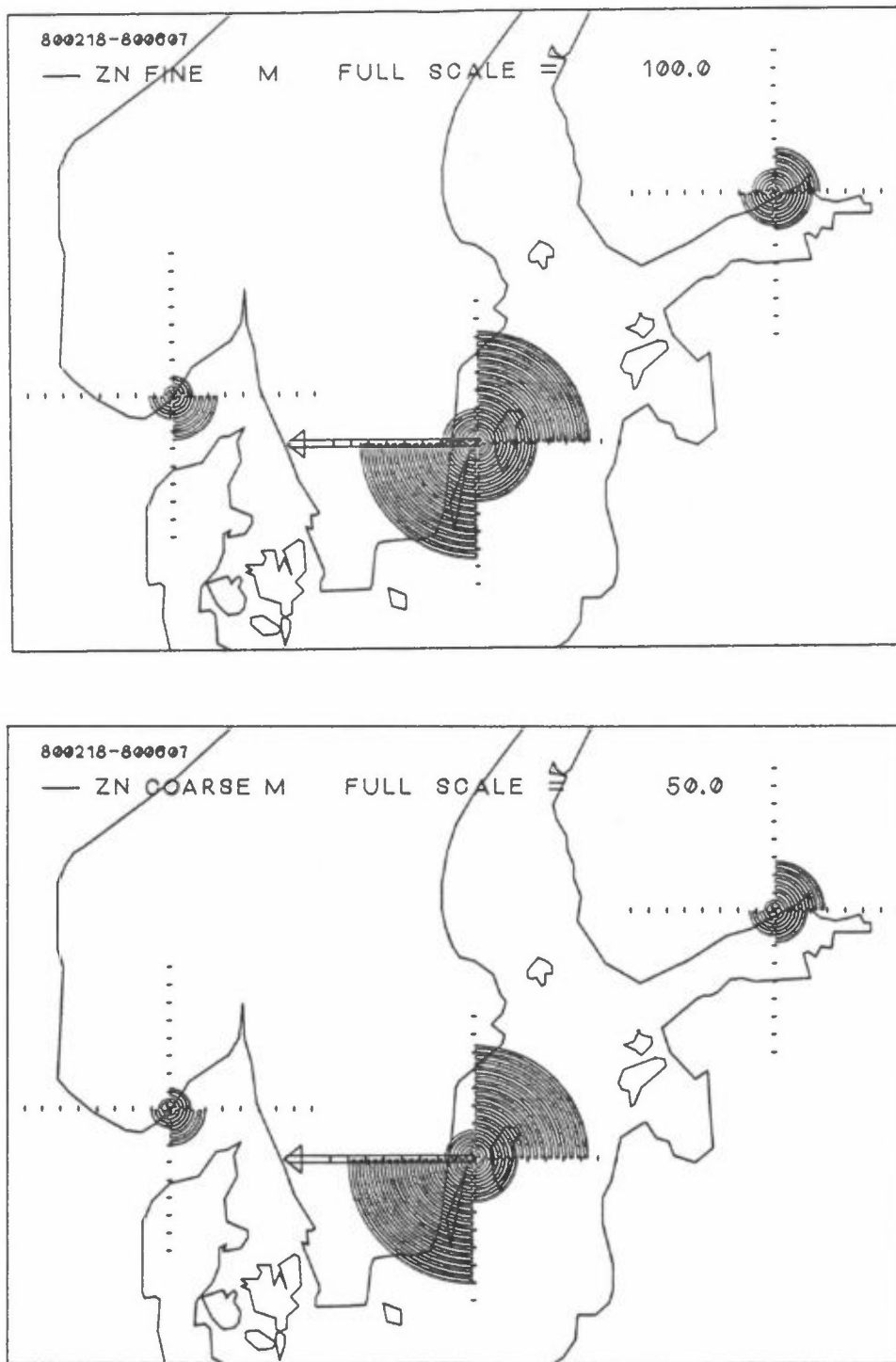


Fig. 27. The sectoral concentrations of Zn in fine and coarse fractions of particles at Rörvik, Virolahti and Birkenes.

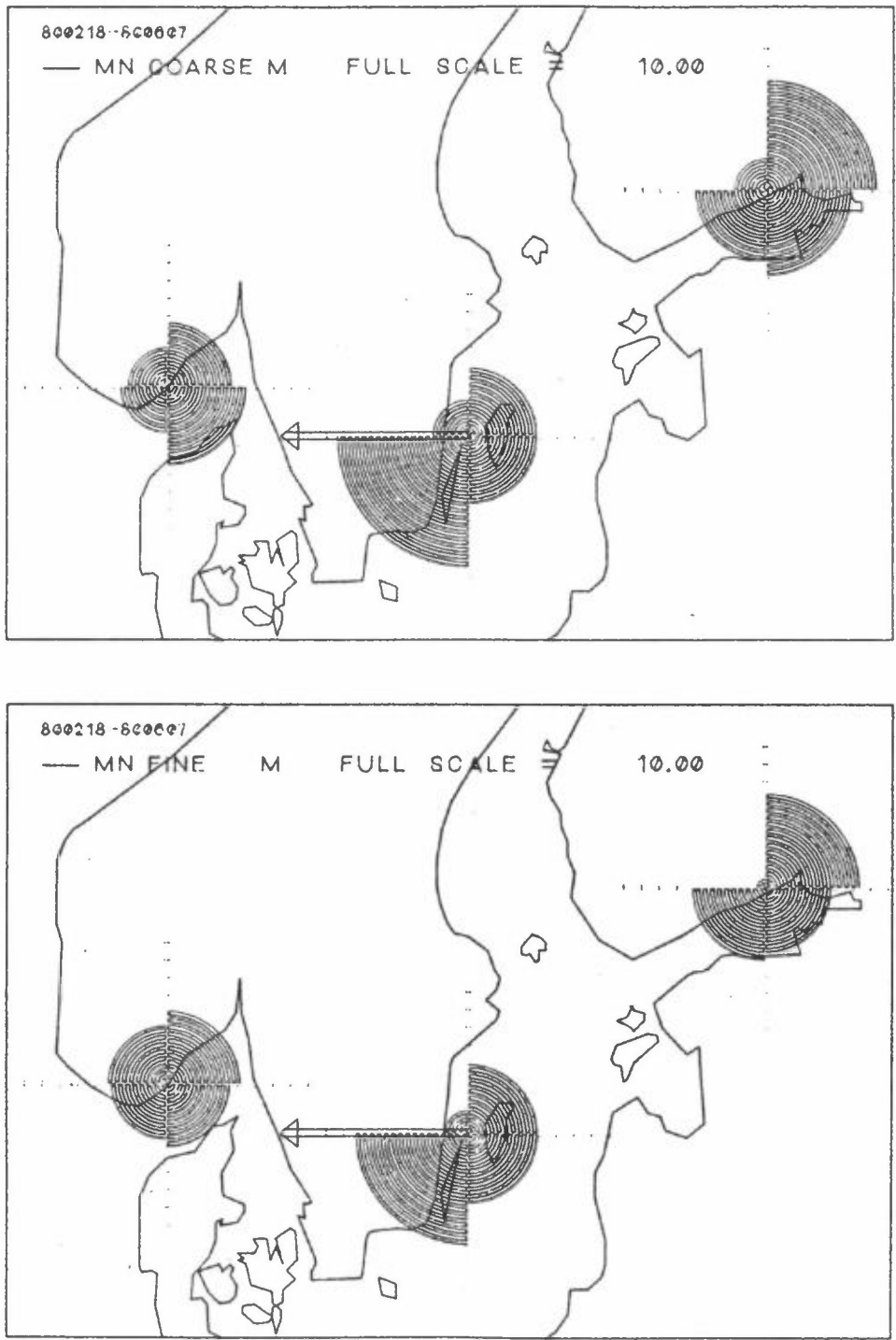


Fig. 28. The sectoral concentrations of Mn in fine and coarse fractions of particles at Rörvik, Virolahti and Birkenes.

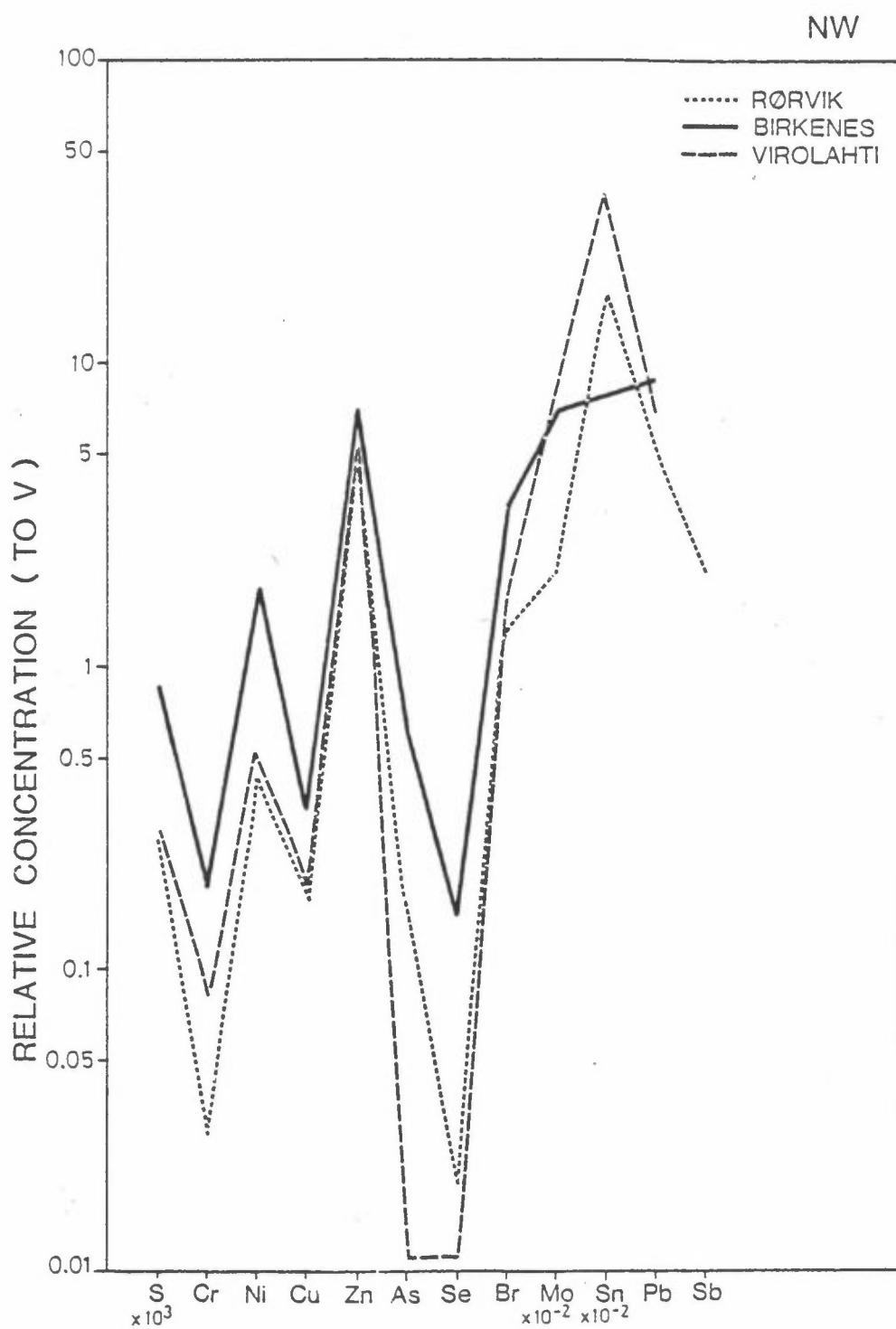


Fig. 29. Elemental diagram for NW sector at Rörvik, Virolahti and Birkenes.

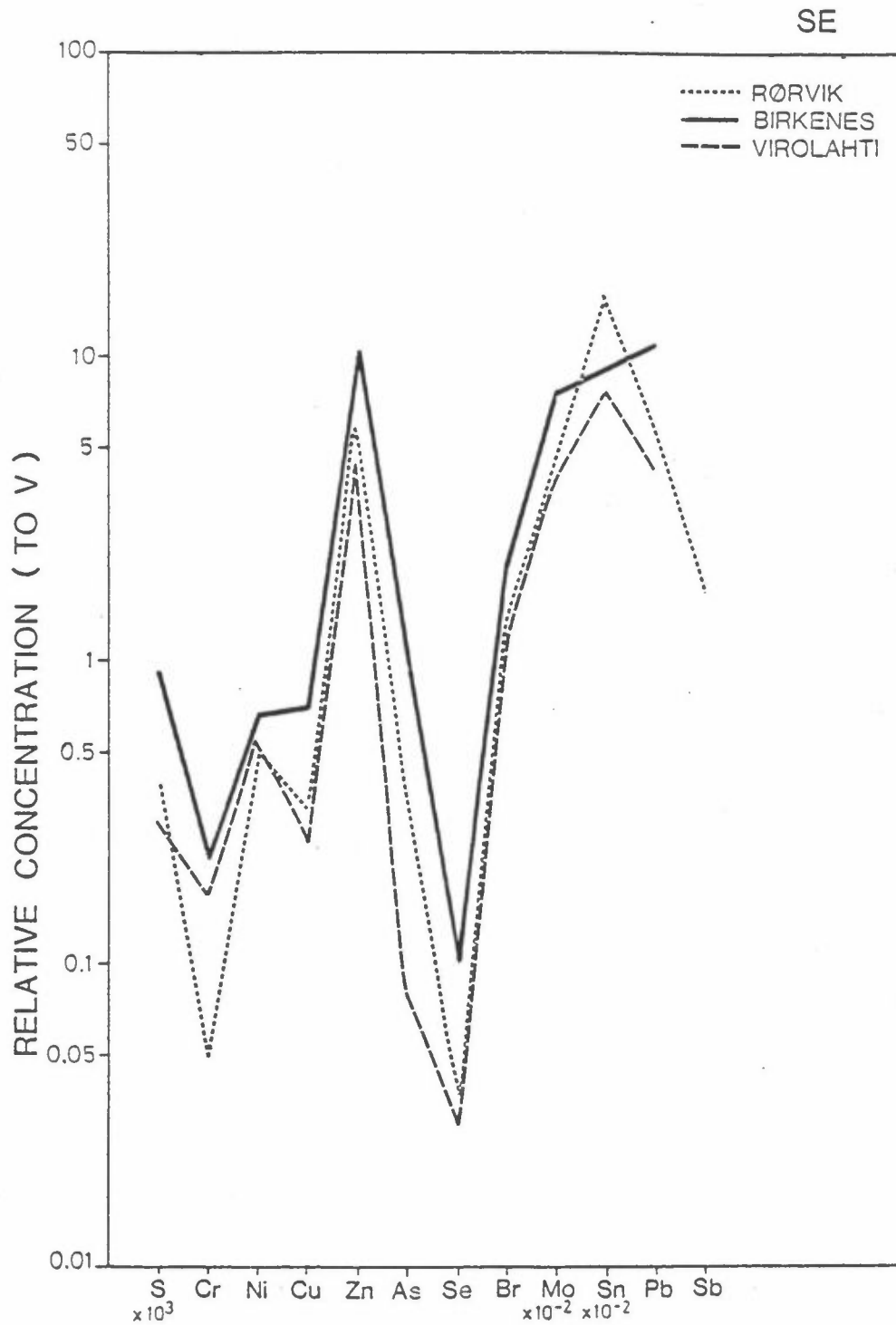


Fig. 30. Elemental diagram for NE sector at Rörvik, Virolahti and Birkenes.

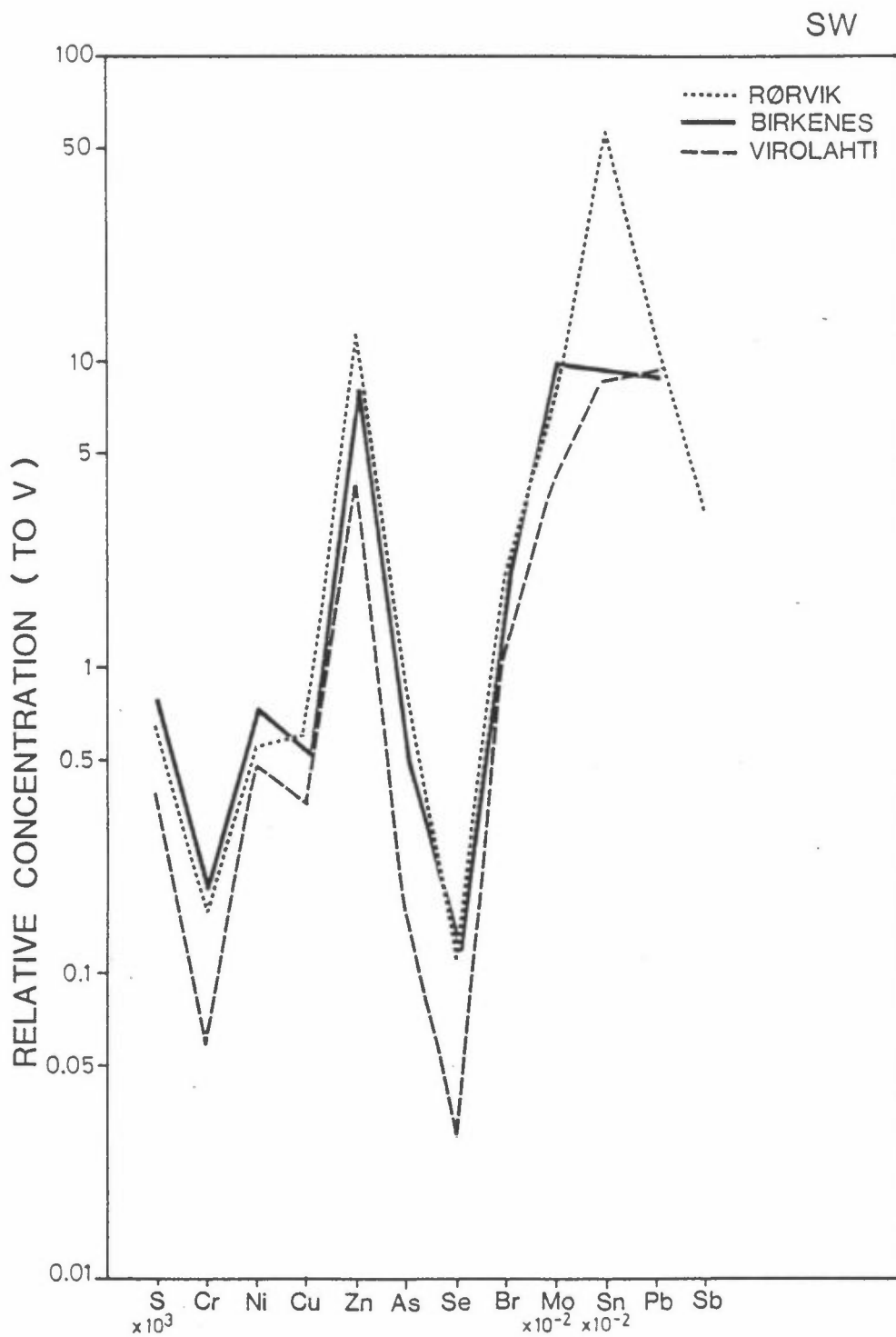


Fig. 31. Elemental diagram for SE sector at Rörvik, Virolahti and Birkenes.

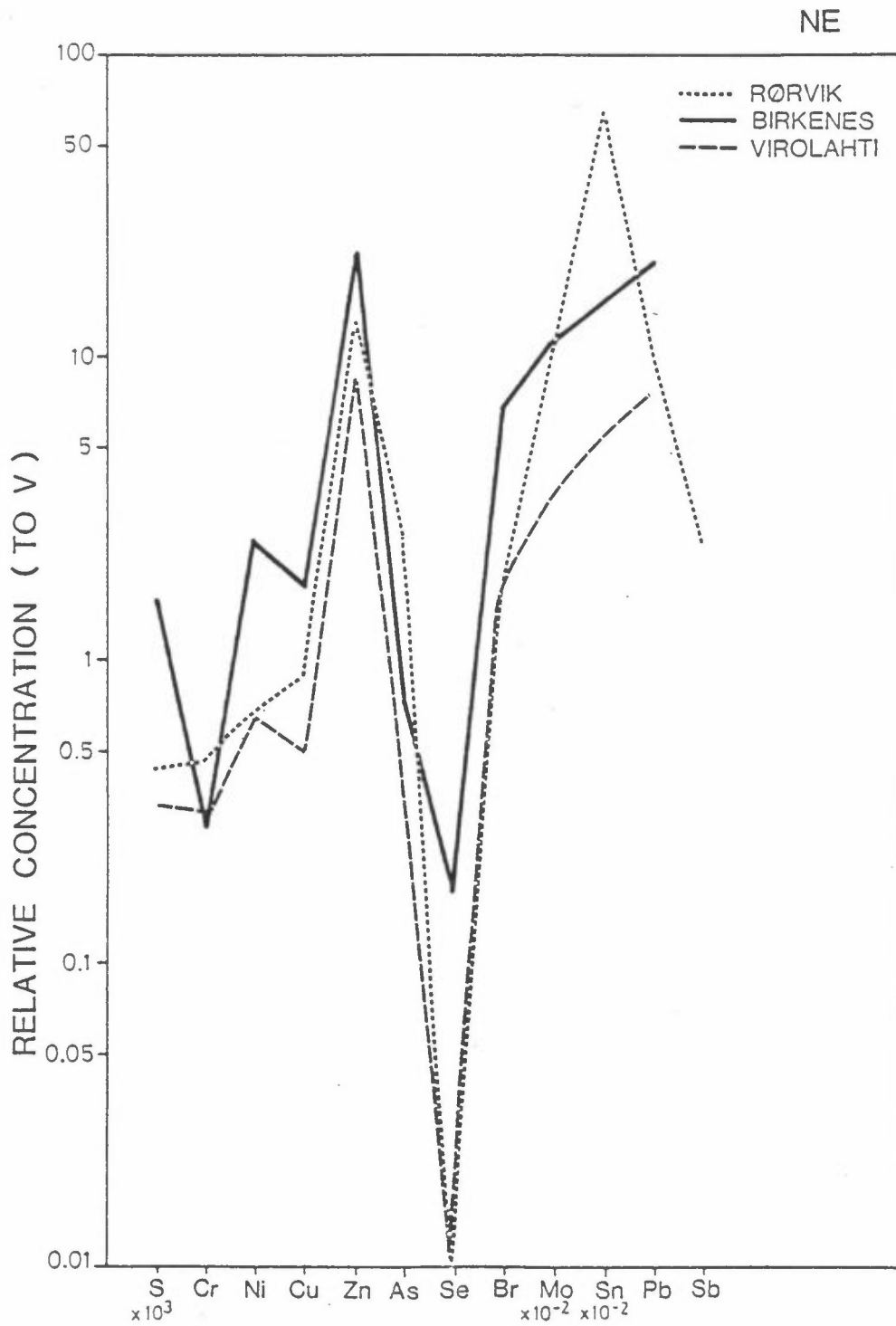


Fig. 32. Elemental diagram for SW sector at Rörvik, Virolahti and Birkenes.

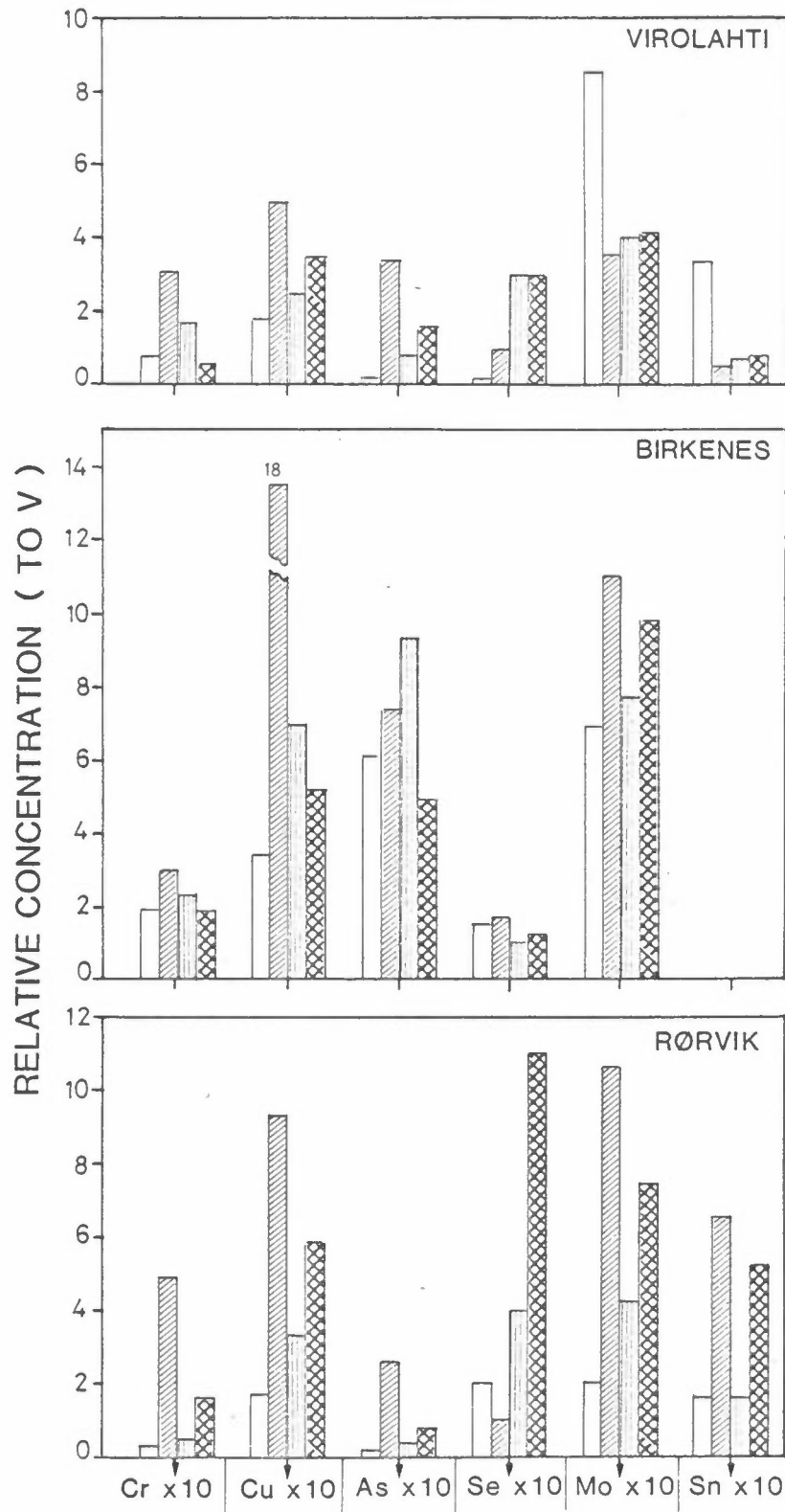


Fig. 33. The sectoral concentrations of various trace elements relative to V at Virolahti, Birkenes and Rørvik.

APPENDIX 1

Daily concentrations of air pollutants at
Birkenes, Rörvik and Virolahti

DIRECHES FIN FRAKTION UGE NO: 13, 1980 NJR FRAKTIONERING *IV24 1

	MAN 24/ 3-80	TID 25/ 3-80	UGE NO: 13, 1980	TOR 27/ 3-80	FRE 28/ 3-80	LOR 29/ 3-80	SUN 30/ 3-80
	*****	*****	*****	*****	*****	*****	*****
KEHI:							
H-03	*	*	*	50.00	70.00	1060.00	1046.00
S-04	*	*	*	2620.00	2350.00	1560.00	1540.00
PO	*	*	*	0.00	18.00	14.00	8.00
PIXG:							
AL	*	*	*	14.90	1140.00	709.00	305.00
SI	*	*	*	40.00	2490.00	1630.00	1590.00
CL	*	*	*	2370.00			
ECA	*	*	*	69.50	99.20	65.10	24.90
TI	*	*	*	10.50	6.97	1.08	
VCR	*	*	*	5.20	5.70	3.87	
UPH	*	*	*	3.70	5.80	3.33	
UCD	*	*	*	2.50	52.80	32.00	20.30
YLN	*	*	*	1.00	3.33	1.86	17.60
ZAS	*	*	*	1.22	3.43	1.52	1.73
SKR	*	*	*	1.16	25.90	1.50	10.90
SRF	*	*	*	4.46	1.15	1.63	2.10
ACO	*	*	*	.47	4.90	3.05	4.13
CSH	*	*	*	.41	.75	.19	.34
SNB	*	*	*			.63	
SBP	*	*	*	0.46	27.40	25.70	13.10
SEP	*	*	*	14.10			
SEIT	*	*	*	2000.00	2820.00	2770.00	1970.00
	*	*	*	3.00	3.00	3.00	1.00

CHIEF :
S-04
SEIT

BIKES		FIN FRACTION		HGE HO: 14, 1980		HHR FRACTIONERING		*HV24 2	
		HAH 31/3-80	TI 1/4-80	OUS 2/4-80	TOP 3/4-80	FRE 4/4-80	LUR 5/4-80	SUN 6/4-80	
		HAHOGRAM/KBH	HAHOGRAM/KBH	MANUGRAM/KBH	HAHOGRAM/KBH	HAHOGRAM/KBH	HAHOGRAM/KBH	MANOGRAM/KBH	
U-03	20.00	*	50.00	*	50.00	*	90.00	90.00	*
S-04	1560.00	*	1910.00	*	350.00	*	160.00	360.00	*
PF	7.00	*	11.00	*	1.00	*	9.00	7.00	*
KCHI:									
AT	209.00	+15%	1440.00	+11%	105.07	+19%	149.00	720.00	+11%
SL	1490.00	+10%	1940.00	+10%	1540.07	+11%	202.00	384.00	+11%
CA	30.40	+16%	62.30	+13%	40.67	+21%	19.60	55.70	+13%
TV	5.35	+37%	9.21	+29%	8.55	+25%	7.76		
TY	2.02	+31%	3.66	+20%		*	1.14	2.43	+20%
HE	9.18	+13%	4.60	+17%	2.15	+38%	.86	7.85	+43%
IL	15.20	+22%	32.90	+11%	10.05	+13%	9.91	10.40	+14%
CUN	1.68	+22%	1.82	+11%	10.67	+19%	5.42	3.47	+16%
KS	7.65	+11%	14.55	+53%	1.55	+50%	2.40	3.63	+13%
SC	1.09	+16%	1.21	+10%	1.22	+19%	1.44	1.19	+40%
SR	1.77	+33%	6.09	+24%	2.69	+49%	2.13	4.95	+27%
SR		*		*		*			*
UD		*		*		*			*
CD		*		*		*			*
SP		*		*		*			*
SB		*		*		*			*
LP	10.00	+11%	10.20	+10%	15.57	+17%	3.95	11.00	+11%
CHEF:									
S-04	1740.00	*	1730.00	*	1430.07	*	130.00	310.00	*
SEL	1.	*	1.	*	4.	*	4.	4.	*

DIMENES		FIN FRAKTION		UGF 110: 15, 1984		NMR FRAKTIONERING		*11V24 3	
		UALL 7/4-80 NANOGRAM/KBH	TIP 8/4-80 NANOGRAM/KBH	DHS 9/4-80 NANOGRAM/KBH	TOP 10/4-80 NANOGRAM/KUN	FRE 11/4-80 NANOGRAM/KRN	UR 12/4-80 NANOGRAM/KBH	SUN 13/4-80 NANOGRAM/KBH	
FCM:									
U-03	30.00	*	10.00	40.00	30.00	50.00	70.00	90.00	*
S-04	130.00	*	30.00	160.00	640.00	1520.00	4050.00	3770.00	*
PR	1.00	*	1.00	2.00	2.00	7.00	34.00	30.00	*
FIXE:									
AY	49.60	+29%	78.40	9.60	584.60	78.30	121.00	197.00	+16%
SCL	137.60	+12%	68.80	179.60	599.00	1210.00	4650.00	4000.00	+10%
CA	10.70	+25%	7.05	17.90	14.10	39.90	64.30	69.00	+13%
TI	9.15	+24%	2.95	11.50	11.21	15.10	16.50	13.20	+23%
Y		*		1.75			2.86	3.04	+26%
CR		*					2.93	3.92	+48%
FL	3.54	+18%	3.72	5.70	1.30	1.19	6.67	2.90	+19%
HC	3.81	+20%		22.00	4.43	15.70	1.31	58.80	+11%
HN		*		2.74			1.09	2.25	+20%
HU	.92	+25%	.83	2.70	4.53	4.42	2.00	30.40	+10%
AS	.37	+46%			1.48		38.00		
SK	.14	+46%		.35	1.66	6.50	.88	68	+20%
SK		*			1.32	2.43	21.33	12.70	+18%
TO		*					.73	.56	+22%
CO		*					3.88		*
CS		*							*
SN		*							*
SR		*							*
PR	2.37	+49%	.33	2.90	3.28	8.75	50.10	41.30	+10%
PR		+15%							
FNEP:									
S-04	140.00	*	70.00	120.00	520.00	1290.00	5130.00	4430.00	*
SCIT	4.	*	1.	1.	4.	4.	4.	3.	*

DIKREKES	FIN FRACTION	UCG NO: 17, 1980	NMR FRACTIONIERING			*HV24 5
	MAN 21/ 4-80 NANOGRAM/KGM	TIN 22/ 4-80 NANOGRAM/KGM	TOR 24/ 4-80 NANOGRAM/KGM	FRE 25/ 4-80 NANOGRAM/KGM	WUR 26/ 4-80 NANOGRAM/KGM	SUN 27/ 4-80
KENT:	50.00	90.00	170.00	110.00	130.00	*
S-04	620.00	500.00	290.00	530.00	1030.00	*
PC	4.00	5.00	9.00	5.00	6.00	*
AL	13.40	18.60	29.90	24.50	47.50	+22%
SI	179.00	536.00	630.00	452.00	1080.00	+11%
CL	547.00	420.00	296.00	435.00	976.00	+10%
BR	34.90	35.70	45.90	43.80	78.30	+12%
CA	10.70	14.50	29.80	48.10	105.00	+12%
Y		1.12	3.23	2.03	5.28	+19%
CU		1.10	1.17			*
FE	73	16.70	7.60	2.82	4.79	+16%
CO	3.81	30.10	47.40	46.59	77.99	+11%
NI	23.32	1.21	.60		.80	+36%
ZN	15.50	7.85	14.10	12.70	13.27	+30%
AS	.65	1.15		.63		+10%
SE	1.93	3.71	4.82	3.96	4.28	+44%
SR	.25	.25		.60	1.20	+50%
ZR					1.40	+15%
MO						*
CD						*
SB						*
BA						*
PA	6.55	7.16	11.70	7.82	10.10	+11%
FIXE:						
S-04	400.00	250.00	170.00	350.00	1150.00	*
SEKT	1.	1.	1.	2.	2.	*

BIRMENES		FIN FRAKTION		UGE 110: 21, 1980		MIR FRAKTIONERING		*IV24 8	
		MAN 19/5-80	TIL 20/5-80	OUS 21/5-80	TOT 22/5-80	FRE 23/5-80	LOR 24/5-80	SON 25/5-80	
		NANOGRAM/KBH	NANOGRAM/KBH	NANOGRAM/KDI	NANOGRAM/KBH	NANOGRAM/KBH	NANOGRAM/KBH	NANOGRAM/KBH	
KCHI:									
S-04	140.00	*	500.00	*	80.00	*	100.00	*	210.00
PO	1500.00	*	2000.00	*	1000.00	*	470.00	*	1220.00
	10.00	*	14.00	*	8.00	*	6.00	*	5.00
FIXC:									
ALY	26.90	+38%	21.00	+36%	281.00	+14%	25.00	+36%	11.00
S	500.00	+12%	760.00	+11%	1040.00	+10%	2000.00	+10%	523.00
CL	1310.00	*	1780.00	*			491.00	+10%	1260.00
EA	49.00	+13%	60.90	+13%	27.17	+46%	38.20	+15%	15.40
TY	28.90	+13%	10.70	+24%	4.62	+36%	18.40	+18%	23.70
CE	4.20	+31%	5.45	+27%	1.13	+47%	2.08	+32%	12.20
HE	2.06	*		*		*		*	
LU	4.88	+15%	3.96	+10%	1.03	+34%	3.03	+18%	3.28
DU	62.70	+11%	41.20	+11%	20.10	+12%	43.80	+11%	19.69
ZUS	0.88	+52%	2.20	+19%	0.86	+34%	3.11	+32%	1.22
AS	11.80	+10%	15.90	+10%	6.05	+11%	20.60	+11%	3.49
SR	0.96	+54%	1.51	+50%				+11%	0.81
CR	0.20	+55%	0.51	+27%	0.26	+29%	0.68	+41%	0.35
RO	4.72	+42%	7.06	+52%	4.11	+27%	2.38	+24%	2.73
DN	0.34	+44%		*		*	.29	*	
SN		*		*		*		*	
SE		*		*		*		*	
LAB	13.80	+11%	16.50	+10%	11.90	+11%	9.19	+11%	6.14
EHER:									
S-04	1.	*	1.	*	1.	*	1.	*	1.
SENT		*		*		*		*	

BIRKCHES		FIN FRAKTION		UCC NO: 22, 108W		HHR FRAKTIONIERUNG		*HV24 9	
U-03	160.00	*							
S-04	920.00	*							
PF	3.00	*							
SEMI:									
U-03	160.00	*		80.00	*	90.00	*	140.00	*
S-04	920.00	*		860.00	*	2940.00	*	2100.00	*
PF	3.00	*		5.00	*	20.00	*	11.00	*
PIXE:									
AL	330.00	+14%		331.00	+13%	22.10	+34%	228.00	+15%
SI	873.00	+10%		770.00	+10%	3180.00	+10%	2180.00	+10%
KL	15.10	+22%		11.60	+24%	70.20	+13%	52.50	+14%
CA	11.20	+22%		11.60	+24%	11.60	+25%	9.07	+28%
TI	.91	+53%		3.11	+22%	0.14	+31%	1.19	+48%
Y	94	+36%		67	+45%	3.93	+17%	3.02	+19%
UN	17.90	+39%		7.77	+30%	44.51	+14%	30.20	+27%
PE	55	+39%		5.87	+11%	1.50	+27%	1.81	+41%
CH	2.35	+15%		3.41	+18%	26.40	+10%	14.20	+52%
CU	1.4	+40%		2.59	+39%	1.74	+53%	1.18	+50%
AS	2.76	+28%		2.35	+36%	6.71	+51%	3.17	+36%
SE	.29	+28%				.15	+47%	.37	+42%
SN									
SO									
FO									
CO									
SU									
PA	4.40	+13%		8.22	+11%	30.30	+10%	18.00	+10%
EHEP:									
SU4	1.	*		3.	*	3.	*	2.	*
SC4	4.	*		3.	*	3.	*	4.	*
U-03	160.00	*		80.00	*	90.00	*	140.00	*
S-04	920.00	*		860.00	*	2940.00	*	2100.00	*
PF	3.00	*		5.00	*	20.00	*	11.00	*
SEMI:									
U-03	160.00	*		80.00	*	90.00	*	140.00	*
S-04	920.00	*		860.00	*	2940.00	*	2100.00	*
PF	3.00	*		5.00	*	20.00	*	11.00	*
PIXE:									
AL	330.00	+14%		331.00	+13%	22.10	+34%	228.00	+15%
SI	873.00	+10%		770.00	+10%	3180.00	+10%	2180.00	+10%
KL	15.10	+22%		11.60	+24%	70.20	+13%	52.50	+14%
CA	11.20	+22%		11.60	+24%	11.60	+25%	9.07	+28%
TI	.91	+53%		3.11	+22%	0.14	+31%	1.19	+48%
Y	94	+36%		67	+45%	3.93	+17%	3.02	+19%
UN	17.90	+39%		7.77	+30%	44.51	+14%	30.20	+27%
PE	55	+39%		5.87	+11%	1.50	+27%	1.81	+41%
CH	2.35	+15%		3.41	+18%	26.40	+10%	14.20	+52%
CU	1.4	+40%		2.59	+39%	1.74	+53%	1.18	+50%
AS	2.76	+28%		2.35	+36%	6.71	+51%	3.17	+36%
SE	.29	+28%				.15	+47%	.37	+42%
SN									
SO									
FO									
CO									
SU									
PA	4.40	+13%		8.22	+11%	30.30	+10%	18.00	+10%
EHEP:									
SU4	1.	*		3.	*	3.	*	2.	*
SC4	4.	*		3.	*	3.	*	4.	*

SUN 1/6-80
NANOGRAM/KBN

LWR 31/5-80
NANOGRAM/KBN

FRE 30/5-80
NANOGRAM/KBN

TOP 29/5-80
NANOGRAM/KBN

ONS 28/5-80
NANOGRAM/KBN

TIL 27/5-80
NANOGRAM/KBN

IAN 26/5-80
NANOGRAM/KBN

U-03
S-04
PF

SEMI:
PIXE:
EHEP:

DILIKENS		FIN FRAKTION		UGF. NO: 23, 1980		NHR FRAKTIONERING		*IV24 10	
		MAN 2/6-80	TIC 3/6-80	ONS 4/6-80	TOR 5/6-80	FRE 6/6-80	LOR 7/6-80	SUN 8/6-80	
		MANOGRAM/KBH	MANOGRAM/KBH	MANOGRAM/KBH	MANOGRAM/KBH	MANOGRAM/KBH	MANOGRAM/KBH		
U-03	110.00	*	110.00	*	130.00	*	380.00	*	*
S-04	1150.00	*	470.00	*	640.00	*	2130.00	*	*
PG	7.00	*	12.00	*	0.00	*	17.00	*	*
KCHI:									
AL	269.00	+14%	24.47	+32%	35.10	+23%	70.80	+22%	*
SL	1610.00	+10%	873.00	+11%	513.00	+12%	629.00	+12%	*
GL	21.50	+25%	605.00	*	740.00	+15%	707.00	+11%	*
KCTI	9.20	+18%	44.50	+14%	39.50	+14%	96.10	+13%	*
YORREI	80	+46%	16.70	+14%	19.00	+18%	43.90	+14%	*
UPREI	23.70	+12%	3.56	+24%	2.69	+20%	3.64	+24%	*
UCESK	9.22	+10%		*		*		*	*
ZASER	.84	+51%		*		*		*	*
ZURK	2.88	+32%		*		*		*	*
ZUCS		*		*		*		*	*
SS		*		*		*		*	*
PP		*		*		*		*	*
PIXE:									
AL	269.00	+14%	24.47	+32%	35.10	+23%	70.80	+22%	*
SL	1610.00	+10%	873.00	+11%	513.00	+12%	629.00	+12%	*
GL	21.50	+25%	605.00	*	740.00	+15%	707.00	+11%	*
KCTI	9.20	+18%	44.50	+14%	39.50	+14%	96.10	+13%	*
YORREI	80	+46%	16.70	+14%	19.00	+18%	43.90	+14%	*
UPREI	23.70	+12%	3.56	+24%	2.69	+20%	3.64	+24%	*
UCESK	9.22	+10%		*		*		*	*
ZASER	.84	+51%		*		*		*	*
ZURK	2.88	+32%		*		*		*	*
ZUCS		*		*		*		*	*
SS		*		*		*		*	*
PP		*		*		*		*	*
CHIEF:									
S-04	9.	*	4.	*	4.	*	9.	*	*
SCIT	9.	*	4.	*	4.	*	2.	*	*
AL	10.70	+11%	10.10	+11%	8.63	+11%	11.90	+11%	*
SL		*		*		*		*	*
GL		*		*		*		*	*
KCTI		*		*		*		*	*
YORREI		*		*		*		*	*
UPREI		*		*		*		*	*
UCESK		*		*		*		*	*
ZASER		*		*		*		*	*
ZURK		*		*		*		*	*
ZUCS		*		*		*		*	*
SS		*		*		*		*	*
PP		*		*		*		*	*

ELEMENTS		GROV FRANTION		UCF NO: 15, 1984		MINK FRACTIONERING		*HV24 13	
		HAH 7/4-80	TIP 8/4-80	OWS 9/4-80	TOP 10/4-80	FRE 11/4-80	LOB 12/4-80	SON 13/4-80	
		MANOGRAM/LBI	MANOGRAM/KBI	MANOGRAM/KBI	MANOGRAM/KBI	MANOGRAM/KBI	MANOGRAM/KBI	MANOGRAM/KBI	
U-03		20.00	*	10.07	50.00	110.00	30.00	440.00	*
S-04		50.00	*	20.07	80.00	320.00	620.00	750.00	*
PR		*	*	*	*	*	*	*	*
KCHI:									
AL		23.20	+23%	33.00	8.51	56.90	171.00	296.00	+12%
SI		50.00	+21%	138.00	65.40	173.00	364.00	599.00	+11%
SL		02.00	+17%	106.07	117.00	389.00	515.00	555.00	+11%
KL		14.20	+18%	120.87	23.40	1084.00	53.30	85.60	+12%
KA		21.80	+15%	25.28	29.00	64.60	76.50	194.00	+13%
TI			+59%	2.81	1.50	79.54	9.61	15.50	+14%
YCP			*		*	*	*	2.10	+34%
CH		1.38	+33%		84	1.18	2.11	5.76	+16%
PH		6.56	+14%	35.47	9.54	45.50	145.00	223.00	+10%
FI			+30%	1.20			1.22		+25%
CH		.28	+39%	1.56	.51	2.49	12.90	13.40	+19%
AS		.55	+40%						+11%
SL		1.55	+24%	.45	1.43	1.88	3.45	2.27	+27%
SR			+50%					2.80	+17%
ZR			+54%				.68	1.90	+14%
UD			*					1.94	+18%
UD			*						*
SH			*						*
SB			*						*
BA		.44	+40%	1.37	.72	2.77	10.80	11.40	+12%

KCHI:
U-03
S-04
PR

PIXE:
AL
SI
SL
KL
KA
TI
YCP

DIMENES	GROV FRAKTION		UGE NO: 20, 1980		NER FRAKTIONERING		*IV24 17	
	HAN 12/ 5-80 HANOGRAM/KEN	TIP 13/ 5-80 NANOGRAM/KEN	OUS 14/ 5-80 NANOGRAM/KEN	TOP 15/ 5-80 NANOGRAM/KEN	FRE 16/ 5-80 NANOGRAM/KEN	HOR 17/ 5-80 HANOGRAM/KEN	SGN 18/ 5-80 NANOGRAM/KEN	
U-03	40.00	90.00	30.00	40.00	30.00	90.00	10.00	*
S-04	30.00		90.00	60.00	70.00	*	120.00	*
PR	*	*	*	*	*	*	*	*
KUMI:								
AL	18.00	415.00	255.00	112.00	87.00	137.00	105.00	+13%
SI	489.00	1629.50	922.61	485.00	311.00	560.00	508.00	+11%
SL	30.60			488.40	125.00	592.10	192.00	+13%
CL	14.50		9.10		9.44			+13%
CA	47.80	250.00	145.00	50.50	49.90	49.00	53.70	+12%
TI	52.80	196.00	119.00	90.60	80.70	78.80	86.50	+12%
VI	11.40	37.60	23.41	99.08	6.79	10.10	9.26	+14%
Y	*	*	*	*	*	*	*	*
PIXI:								
CP	1.90	7.41	6.21	4.11	4.86	2.91	6.29	+37%
HP	109.00	380.00	225.00	120.00	82.70	114.00	119.00	+16%
HY	*	*	1.91		1.24	85	74	+11%
HU	*	*	1.47		5.14	3.40	72	+29%
ZU	1.30	5.51	4.81	2.74	5.14	3.40	5.50	+4%
AS	*	*	*	*	*	*	*	+15%
SE	1.18	1.38	1.17	0.9	1.98	2.15	1.53	+24%
SK	.68	1.59	1.51	1.82	.67	.72	.63	+19%
ZR	.34	1.30	1.59	.85	.32	.50	.35	+27%
HO	*	*	*	*	*	*	*	+25%
CO	*	*	*	*	*	*	*	*
CH	*	*	*	*	*	*	*	*
SP	*	*	*	*	*	*	*	*
PA	4.91	10.80	5.48	3.14	1.93	2.45	6.22	+53%
PO	1.59	2.86	3.55				3.80	+19%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%
								+17%
								+18%
								+15%</

DILUKES		GRUV FRAKTION		UGE 110: 22, 1980		NUR FRAKTIONERING		*11V24 19	
		HAN 26/ 5-80 HANOGRAM/KBH	TIL 27/ 5-80 HANOGRAM/KBH	ONS 23/ 5-80 HANOGRAM/KBH	TOR 29/ 5-80 HANOGRAM/KBH	FRE 30/ 5-80 HANOGRAM/KBH	LØR 31/ 5-80 HANOGRAM/KBH	SUN 1/ 6-80 HANOGRAM/KBH	
U-03	60.00	*	40.00	*	570.00	*	10.00	*	*
S-04	120.00	*	130.00	*	580.00	*	160.00	*	*
PR								40.00	*
KENI:									
AL	65.50	+16%	94.50	+14%	15.70	+32%	71.00	+15%	27.30
SI	267.00	+13%	337.00	+12%	159.00	+14%	219.00	+13%	298.00
CL	42.00	+16%	50.50	+12%	19.27	+16%	38.10	+13%	59.60
ECA	72.30	+12%	69.70	+18%	11.17	+19%	43.15	+13%	33.20
TI	8.34	+14%	8.86	+14%	1.89	+32%	3.97	+19%	66.90
YCB	1.27	+38%	.89	+52%	.89	+40%	.97	+41%	14.50
QU	3.54	+17%	3.70	+17%	.97	+25%	9.74	+27%	5.85
HE	76.51	+14%	95.97	+10%	16.97	+12%	57.30	+11%	17.90
LI	5.31	+16%	1.97	+20%	.41	+42%	.39	+42%	1.72
CH	4.16	+13%	1.99	+21%	1.87	+14%	.57	+38%	.97
AS		*	2.53	+14%		*	6.93	+12%	
SR		*	31	+33%		*	11	+45%	
LR	1.62	+29%	1.40	+23%	1.37	+23%	2.01	+19%	.80
SK		*	1.40	+19%	.17	+48%	.41	+23%	.21
ZU		*	.63	+27%	.10	+52%	.15	+51%	
CO		*		*		*		*	
CU		*		*		*		*	
SB		*		*		*		*	
PA	5.89	+46%	3.09	+16%	1.92	+10%	4.42	+14%	.95
BP		*		*		*		*	
FXC:									
AL		+12%		+12%	85.50	+14%		+12%	27.30
SI		+13%		+14%	395.00	+11%		+12%	298.00
CL		+16%		+16%	37.00	+13%		+12%	59.60
ECA		+14%		+14%	59.50	+18%		+12%	33.20
TI		+38%		+40%	5.82	+16%		+19%	66.90
YCB		*		*		*		*	14.50
QU		+17%		+25%	3.66	+23%		+27%	5.85
HE		+14%		+12%	70.20	+11%		+11%	17.90
LI		+16%		+42%	.57	+38%		+42%	1.72
CH		+13%		+14%	9.82	+11%		+12%	.97
AS		*		*		*		*	
SR		+29%		+23%	1.10	+47%		+45%	
LR		+15%		+48%	1.36	+20%		+19%	.80
SK		*		*		*		*	.21
ZU		*		*		*		*	
CO		*		*		*		*	
CU		*		*		*		*	
SB		*		*		*		*	
PA		+46%		+10%	4.42	+14%		+14%	.95
BP		+19%							

ELEMENTS	GROV FRAKTION		USE NO: 23, 1980		NHR FRAKTIONEN		NHR FRAKTIONEN		SUN 3/ 6-80	*HV24 24		
	HAANOGRAM/KDN	2/ 6-80	TID HAANOGRAM/KDN	3/ 6-80	QMS HAANOGRAM/KDN	4/ 6-80	TOG HAANOGRAM/KDN	5/ 6-80			FRE HAANOGRAM/KDN	6/ 6-80
U-03	20.00	* * *	14.00	* * *	44.00	* * *	90.00	* * *	10.00	* * *	20.00	* * *
S-04	200.00	* * *	90.00	* * *					500.00	* * *	140.00	* * *
PB												
KEHT:												
AL	45.50	+18%	105.00	+14%	76.47	+15%	97.30	+14%	191.00	+12%	146.00	+13%
SI	197.00	+14%	389.00	+12%	353.07	+12%	373.00	+14%	585.00	+11%	136.00	+11%
CL	23.80	+12%	32.30	+14%	45.87	+16%	6.40	+13%	579.00	+11%	659.00	+15%
KA	36.90	+15%	106.00	+13%	61.57	+15%	79.70	+15%	114.00	+11%	107.00	+11%
TI	3.67	+19%	7.39	+15%	41.07	+16%	6.56	+14%	18.60	+13%	10.40	+14%
Y												
CP	4.09	+20%	1.00	+36%	3.08	+26%	4.72	+15%	5.41	+24%	4.10	+17%
HI	42.00	+11%	126.00	+17%	72.97	+17%	96.50	+18%	195.00	+10%	136.00	+10%
CH												
HO	7.24	+49%	1.82	+22%	1.08	+24%	4.38	+43%	1.50	+41%	6.18	+27%
ZS												
AS												
AP	07	+53%	1.09	+20%	.65	+38%	.81	+31%	3.23	+46%	1.86	+19%
CP	1.60	+21%	1.03	+16%	.81	+17%	1.08	+16%	1.98	+14%	1.21	+15%
SR	.61	+19%	.21	+49%	.21	+50%	.56	+36%	.80	+27%	.63	+26%
ZO												
ECR												
SK												
SB												
PA	2.88	+16%	3.34	+15%	2.21	+17%	5.81	+47%	13.70	+12%	4.11	+15%

RURVIK	FIN FRAKTION	UCE NO:	8, 1980	NIR FRAKTIONERING	*HV24	1	
	NAN 18/ 2-80	TIR 19/ 2-80	ONS 20/ 2-80	TOR 21/ 2-80	FRE 22/ 2-80	LWR 23/ 2-80	SON 24/ 2-80
	NANOGRAM/KBM	NANOGRAM/KBM	NANOGRAM/KBM	NANOGRAM/KBM	NANOGRAM/KBM	NANOGRAM/KBM	NANOGRAM/KBM
KEMI:	276.00	640.00	523.00	542.00	274.00	418.00	232.00
N-04	1790.00	2830.00	3570.00	3540.00	1440.00	3290.00	1230.00
CL	123.00	47.10	74.20	68.90	1479.80	43.00	43.30
PIXE:							
AL	270.00	108.00	9.60	87.70	128.00	9.07	1330.00
S	1870.00	2850.00	3900.00	2390.00	3910.00	2360.00	1330.00
CL	153.10	121.00	127.00	103.00	00.00	40.00	50.00
KAI	21.50	19.21	18.70	20.76	15.59	14.40	50.00
TV	6.25	4.13	5.35	6.32	8.00	7.09	2.12
CR	1.75	1.05	2.21	1.00	3.17	2.91	1.00
FR	20.40	5.90	73.90	63.96	43.30	46.40	15.00
PI	2.00	3.36	3.10	3.30	3.27	4.30	15.00
NU	15.50	3.81	4.70	3.70	1.70	1.90	1.63
Z	1.50	65.00	75.86	70.00	35.60	30.55	24.10
AS	8.29	4.09	3.64	7.40	2.16	5.44	1.24
BR	31	13.40	10.60	13.20	7.41	11.30	3.44
SR	31	50	37	35	40	.32	
MO		50	37	35	40		
OD		1.39	1.03	1.03	2.19	2.43	
SN		1.81	1.23	2.06	2.18	2.43	
SB		75.40	63.90	85.20	39.90	63.90	20.80
BA	18.00						
EMEP	2450.00	4800.00	11100.00	5900.00	9730.00	7580.00	4680.00
S-04							

RORVIK	FIN FRAKTION	UGE NO:	9, 1980	NIR FRAKTIONERING	*HV24	2	
	MAN 35/ 2-80 NANOGRAM/KBM	TIR 26/ 2-80 NANOGRAM/KBM	ONS 27/ 2-80 NANOGRAM/KBM	TOR 28/ 2-80 NANOGRAM/KBM	FRE 29/ 2-80 NANOGRAM/KBM	LØR 1/ 3-80 NANOGRAM/KBM	SØN 2/ 3-80 NANOGRAM/KBM
N-03	422.00	816.00	476.00	497.00	199.20	192.00	598.00
S-04	2160.00	3790.00	3690.00	1790.00	379.00	231.00	1572.00
CL	51.00	73.40	111.00	41.00	101.00	530.00	196.40
KENI:							
AL	193.00	200.00	95.70	8.40	213.00	15.80	320.00
SI	3740.00	3400.00	2910.00	180.00	477.00	268.00	396.00
SK	85.00	150.00	180.00	41.00	101.00	16.00	14.50
CI	16.00	2.06	19.00	10.00	17.00	18.20	19.00
TI	8.65	4.10	5.16	5.10	4.19	1.19	2.70
VCR	1.93	0.82	4.17	1.63	6.46	2.89	7.17
MNEI	56.00	108.00	3.12	3.58	1.33	1.22	7.87
FN	4.85	3.14	2.12	2.64	4.49	.73	2.42
CUN	1.75	84.00	51.60	49.00	4.49	.56	1.39
ZAS	41.40	4.05	17.45	4.24	3.46	2.30	2.00
SR	.28	9.47	8.32	1.24	1.2	.77	2.24
SR	.32	.36	.45	.34	3.46	.35	.00
NO	2.18	1.22	3.84	1.32	3.46	2.30	2.00
SN	.37	1.74	3.84	3.58	3.46	2.30	2.00
DA	57.10	68.80	42.60	41.00	6.29	1.48	4.59
PH							
EMEP:							
S-04	9460.00	5480.00	5240.00	900.00	730.00	480.00	400.00

KENI:

PIXE:

EMEP:

RORVIK	FIN FRAKTION	UGE NO: 10, 1980	NIIR FRAKTIONERING			HV24 3	
	MAN 3/3-80 NANOGRAM/KBM	TIR 4/3-80 NANOGRAM/KBM	ONS 5/3-80 NANOGRAM/KBM	TOR 6/3-80 NANOGRAM/KBM	FRE 7/3-80 NANOGRAM/KBM	LOR 8/3-80 NANOGRAM/KBM	SON 9/3-80 NANOGRAM/KBM
N-03	195.00	278.00	1810.00	1120.00	1610.00	986.00	545.00
S-04	290.00	288.00	1650.00	420.00	1040.00	389.00	4268.00
CL	86.00	54.10	333.00	157.00	196.00	163.00	155.00
KEMI:							
AL	31.40	13.00	46.10	52.00	28.90	61.60	62.10
SL	39.00	345.00	1620.00	320.00	388.00	123.00	369.00
CL	86.00	357.00	1393.00	157.00	296.00	129.00	137.00
CT	34.70	58.70	66.30	151.00	53.90	22.10	11.30
VI	4.95	4.56	16.10	1.70	5.65	3.96	6.65
CR	1.22	1.20	11.00	1.50	5.08	3.36	4.22
FE	34.31	28.80	3.90	13.50	15.70	6.36	113.05
NU	2.31	1.92	49.90	18.00	196.45	12.89	117.14
NS	14.70	17.50	3.68	37.70	36.47	1.89	11.19
ZS	2.71	5.20	57.50	107.00	131.00	43.16	22.91
SR			15.51	15.70	18.81	11.26	11.56
RD			15.41	15.55	18.61	11.26	11.51
CD			.47	2.75	1.74	2.53	
SN			2.19	2.05	3.93	2.14	1.73
SB				3.75	6.02	1.80	
PA	13.50	24.20	51.60	95.78	108.00	47.60	41.60
PP							
EMEP:							
S-04	230.00	60.00	2680.00	8190.00	7620.00	7240.00	7920.00

AL 31.40
SL 39.00
CL 86.00
CT 34.70
VI 4.95
CR 1.22
FE 34.31
NU 2.31
NS 14.70
ZS 2.71
SR
RD
CD
SN
SB
PA
PP

RORVIK	FIN FRAKTION	UGE NO:	12, 1980	NIR FRAKTIONERING	*HV24	5
	MAN 17/ 3-80			FRE 21/ 3-80	LOR 22/ 3-80	SUN 23/ 3-80
	NANOGRAM/KBM			NANOGRAM/KBM	NANOGRAM/KBM	NANOGRAM/KBM
N-03	184.00	*	312.00	*	167.00	206.00
S-04	2140.00	*	3620.10	*	2600.80	3470.00
CL	74.30	*	46.10	*	37.80	31.00
KEMI:						
AL	51.80	+50%	36.70	+50%	34.50	46.80
SI	240.00	+14%	381.00	+10%	213.00	215.00
CL	2480.00	+10%	3280.00	+10%	210.00	2910.00
K	74.00	+22%	46.10	+12%	37.80	122.00
C	127.00	+17%	157.00	+14%	61.00	144.60
A	29.00	+15%	8.99	+20%	4.00	45.20
T	7.93	+25%	6.46	+20%	0.12	10.20
V	7.37	+30%	3.71	+17%	3.57	4.97
CR	5.76	+10%	6.50	+10%	94.00	118.00
ME	101.00	+10%	215.00	+10%	44.19	118.73
NI	4.15	+10%	5.97	+26%	1.01	1.45
CU	23.10	+10%	124.00	+10%	23.89	36.67
Z	39.96	+15%	128.00	+15%	7.52	6.77
AS	8.25	+20%	18.80	+19%	1.58	1.93
S	8.66	+26%	1.12	+31%	1.58	1.93
BR	.38	+41%	8.54	+20%	3.03	6.85
SM	.55	*	4.64	+20%	20.90	31.30
OD	32.10	+10%	91.80	+10%	20.90	31.30
SN	6.89	+43%				
BA	21.00	+10%				
CP						
EMEP:						
S-04	3200.00	*	5000.00	*	4300.00	6740.00

RORVIK	FIN	FRAKTION	UGE NO:	13,	1980	NIR	FRAKTIONERING	*HV24	6					
	MAH 24/	3-80	TIR 25/	3-80	ONS 26/	3-80	TOR 27/	3-80	FRE 28/	3-80	LØR 29/	3-80	SØN 30/	3-80
	NAKROGRAM/KBM		NAKROGRAM/KBM		NAKROGRAM/KBM		NAKROGRAM/KBM		NAKROGRAM/KBM		NAKROGRAM/KBM		NAKROGRAM/KBM	
N-03	217.00	*	360.00	*	360.00	*	263.00	*	826.00	*	291.00	*	447.00	*
S-04	3570.00	*	6380.00	*	6380.00	*	4800.00	*	2910.00	*	4020.00	*	2530.00	*
CL	95.80	*	39.30	*	39.30	*	123.00	*	110.20	*	72.90	*	98.50	*
KEHI:														
PIXE:														
AL	51.20	+50%	27.20	+50%	27.20	+50%	235.00	+15%	21.40	+50%	11.90	+50%	18.20	+50%
SI	33.00	+10%	174.00	+10%	174.00	+10%	4150.00	+10%	250.00	+10%	30.00	+10%	972.00	+10%
CL	3270.80	+21%	2219.30	+21%	2219.30	+21%	1225.00	+19%	110.00	+20%	1072.00	+19%	2272.50	+19%
KCA	122.30	+14%	79.60	+14%	79.60	+14%	110.00	+12%	126.00	+12%	25.30	+12%	66.19	+12%
TV	51.74	+18%	30.50	+18%	30.50	+18%	126.00	+27%	126.00	+27%	26.04	+27%	117.20	+27%
V	9.29	+15%	7.45	+15%	7.45	+15%	5.98	+17%	5.79	+19%	2.05	+19%	6.43	+16%
CR	2.67	+44%	1.45	+44%	1.45	+44%	1.77	+17%	1.77	+17%	2.05	+17%	6.43	+16%
HF	8.89	+15%	3.60	+15%	3.60	+15%	7.51	+14%	7.34	+15%	6.69	+15%	4.60	+16%
NI	158.91	+17%	79.60	+17%	79.60	+17%	123.00	+19%	82.82	+13%	1.16	+16%	41.20	+17%
U	41.08	+20%	3.80	+20%	3.80	+20%	1.00	+11%	3.82	+21%	1.02	+11%	21.90	+17%
ZN	36.10	+10%	24.00	+10%	24.00	+10%	54.76	+10%	31.60	+21%	10.02	+10%	1.06	+12%
AS	4.00	+29%	24.00	+29%	24.00	+29%	2.76	+40%	6.70	+52%	10.00	+10%	1.90	+18%
SER	36.36	+22%	34	+26%	34	+26%	4.99	+20%	8.55	+24%	8.11	+22%	20	+38%
SR	7.02	+10%	5.50	+20%	5.50	+20%	3.36	+31%	8.55	+30%	0.20	+36%	7.20	+31%
HO	1.53	+29%	.29	+44%	.29	+44%	2.34	+37%	3.50	+50%	6.03	+22%	.60	+27%
CD		*		*		*		*		*		*		*
SN	2.26	+43%	6.80	+46%	6.80	+46%	2.90	+35%	2.51	+47%	6.03	+22%		*
SB	35.80	+10%	24.50	+10%	24.50	+10%	43.00	+10%	71.40	+10%	23.00	+10%	24.50	+10%
PA		*		*		*		*		*		*		*
S-04	6880.00	*	4990.00	*	1940.00	*	8320.00	*	10200.00	*	2620.00	*	4160.00	*

RORVIK		FIN FRAKTION		UGE NO: 14, 1980		NMR FRAKTIONERING		*HV24 7	
		TIR 1/4-80 NANOGRAM/KBM	ONS 2/4-80 NANOGRAM/KBM	TOR 3/4-80 NANOGRAM/KBM	FRF 4/4-80 NANOGRAM/KBM	LOR 5/4-80 NANOGRAM/KBM	SON 6/4-80 NANOGRAM/KBM		
KEMI:		210.00	185.00	230.00	196.00	724.00	1870.00		
S-04		1560.00	1780.00	2230.00	427.00	942.00	1342.00		
CL									
PIXE:		7.90	10.70	8.94	21.60	39.90	22.70		
AL		13.20	68.50	317.00	266.00	1020.00	168.00		
S		1470.00	2160.00	2000.00	471.00	1420.00	1800.00		
CL		1960.00	88.20	65.60	124.90	3489.00	1343.00		
K		59.30	34.90	12.27	8.01	27.50	151.00		
A		70.10	6.40	7.05	4.72	14.60	11.70		
T		18.20	2.98	3.02	63	2.94	1.52		
V		6.02	1.04	3.06	15.10	15.77	24.90		
CR		3.98	14.34	3.04	12.71	1.78	4.64		
M		2.80	1.58	5.04	10.70	1.78	41.10		
FL		2.70	13.20	21.60	1.18	149.98	41.10		
N		1.75	4.41	11.30	5.08	13.50	13.20		
I		1.75	1.58	.28	.28	13.49	12.11		
U		17.20	13.20	.36	.36	.26	.93		
C		17.20	4.41	1.16	1.16	13.50	1.87		
N		3.81	4.41	40.50	18.50	75.20	54.10		
A		.28	4.41	2700.00	570.00	1220.00	2140.00		
S		.23	4.41	2700.00	570.00	1220.00	2140.00		
ER		1.30	21.00	2700.00	570.00	1220.00	2140.00		
R		1.30	21.00	2700.00	570.00	1220.00	2140.00		
RO		20.30	21.00	2700.00	570.00	1220.00	2140.00		
MO			2200.00	2700.00	570.00	1220.00	2140.00		
CD			2200.00	2700.00	570.00	1220.00	2140.00		
SH			2200.00	2700.00	570.00	1220.00	2140.00		
SU			2200.00	2700.00	570.00	1220.00	2140.00		
BA			2200.00	2700.00	570.00	1220.00	2140.00		
EMEP:									
S-04		16.20	21.00	2700.00	570.00	1220.00	2140.00		

RORVIK

RORVIK	FIN	FRAKTION	UGE NO:	15,	1980	NMR FRAKTIONERING				*HV24	8
						TOR 10/ 4-80	FRE 11/ 4-80	HØR 12/ 4-80	SUN 13/ 4-80		
						NAOGRAM/KUM	NAOGRAM/KUM	NAOGRAM/KUM	NAOGRAM/KUM		
N-O3						169.00	409.00	935.00	1700.00	*	*
S-04						411.00	1350.00	3150.00	6530.00	*	*
CL						107.00	327.00		202.00	*	*
KEMI:											
AL						23.00	13.80	19.20	13.70	+50%	+50%
SI						325.00	68.60	82.10	186.00	+13%	+10%
SCL						501.00	1540.00	3430.00	5232.00	+11%	+14%
KA						107.00	327.00	219.00	232.00	+14%	+21%
CA						18.00	22.00	19.00	89.20	+20%	+15%
TI						18.00	22.00	19.00	89.20	+20%	+15%
V						2.94	5.81	7.48	7.53	+20%	+17%
CR						1.83	1.55	.81	4.46	+30%	+17%
MM						23.00	15.80	25.00	73.00	+13%	+19%
FE						1.00	1.69	2.21	3.15	+20%	+21%
NC						1.20	1.60	1.60	2.44	+10%	+10%
UN						7.00	3.92	16.00	52.30	+10%	+10%
AS						1.12	3.1	4.6	7.6	+42%	+19%
SE						1.06	10.70	13.00	25.90	+38%	+16%
SR						1.18	10.40	13.28	37.41	+38%	+38%
NO						*	*	*	*	*	*
CD						*	*	*	*	*	*
SN						*	*	*	*	*	*
SB						*	*	*	*	*	*
BA						*	*	*	*	*	*
PB						*	*	*	*	*	*
EMEP:											
S-04						700.00	2210.00	4910.00	10940.00	+11%	+10%
						800.00	1590.00	38.60	73.30	+11%	+10%

RURVIK	GROV FRAKTION	UGE NO:	8, 1980	MIIR FRAKTIONERING	*HV24 1		
	MAH 18/ 2-80	TIR 19/ 2-80	ONS 20/ 2-80	TOR 21/ 2-80	FRE 22/ 2-80	LØR 23/ 2-80	SØN 24/ 2-80
	HA/NOGRAM/KBM	HA/NOGRAM/KBM	NA/NOGRAM/KBM	NA/NOGRAM/KBM	NA/NOGRAM/KBM	NA/NOGRAM/KBM	NA/NOGRAM/KBM
PIXE:							
AL	20.60	123.00	130.00	25.40	69.50	40.40	16.20
SI	262.00	711.00	1210.00	246.00	616.00	370.00	273.00
CL				676.00	1520.00	159.00	
SK	28.40	105.00	124.00	54.00	91.70	32.40	14.20
KA	.82	101.00	23.90	25.00	15.20	6.20	
TI	1.39	10.00	2.30	1.00	1.30	8.97	36
Y	43.10	18.00	2.30	1.00	1.30	1.30	45
CR	.52	5.13	2.30	1.00	1.30	1.67	8
NE	15.60	35.00	46.70	15.00	37.00	126.00	19
FI			2.30	1.00	1.30	1.43	46
NI			3.17	1.00	1.30	15.10	53
CH			1.00	1.00	1.30		
AS			1.47	1.00	1.30		
SER	.31	2.18	3.17	.56	1.37	1.12	
BR	.19	.99	1.97	.25	1.37	1.24	
SKO		1.17	4.94	.05	1.37	1.75	
MO		19.85	46.80	17.00	33.00	38.20	
CS		14.50					
SB							
BA	9.90						4.00
PB							

RURVIK	GROV FRAKTION	UGE NO:	9, 1980	MIIR FRAKTIONERING	*HV24 2		
	MAH 25/ 2-80	TIR 26/ 2-80	ONS 27/ 2-80	TOR 28/ 2-80	FRE 29/ 2-80	LØR 1/ 3-80	SØN 2/ 3-80
	HA/NOGRAM/KBM	HA/NOGRAM/KBM	NA/NOGRAM/KBM	NA/NOGRAM/KBM	NA/NOGRAM/KBM	NA/NOGRAM/KBM	NA/NOGRAM/KBM
PIXE:							
AL	25.30	30.40	37.00	19.90	35.00	191.00	4.70
SI	218.00	234.00	530.00	182.00	351.00	2648.00	140.00
CL	100.00	867.00	621.00	1470.00	1240.00	103.00	110.00
SK	24.30	40.00	49.60	74.00	51.00	2648.00	3.20
KA	14.00	47.42	66.60	11.89	1.90	1.39	1.43
TI	13.01	2.06	1.89	.95	1.06	1.03	1.97
Y	.39	1.13	3.16	3.74	1.70	20.20	1.58
CR	55.76	80.90	163.00	55.06	22.14	36	62
NE	.39	1.07	1.64	1.77	2.84	2.73	1.14
FI	4.78	17.00	17.88	10.20	10.10	.49	4.64
NI	.06						
CH	.40	.79	.73	4.55	4.56	12.00	.77
AS		.17	.23	1.59	1.59	1.50	
SER		.83	1.00				
BR							
SKO							
MO							
CS							
SB							
BA	13.70	12.20	24.30	9.28	13.60	7.93	5.13
PB							

RORVIK	GROV FRAKTION		UGE NO: 10, 1980		NIIR FRAKTIONERING		*HV24 3	
	MAH NANOGRAM/KBM	TIR NANOGRAM/KBM	ONS NANOGRAM/KBM	TOR NANOGRAM/KBM	FRE NANOGRAM/KBM	LOR NANOGRAM/KBM	SUN NANOGRAM/KEM	
AL	14.90	18.10	38.60	232.00	147.80	43.90	17.80	+
SL	15.30	16.00	204.00	180.00	964.60	308.00	231.00	+
CL	771.00	144.00	447.00	101.00	537.60	125.00	81.60	+
KA	36.80	39.60	1160.00	19.00	425.00	169.00	74.60	+
TV	51.51	35.67	131.99	35.00	255.05	91.18	1.29	+
CR	1.54	1.24	4.61	2.33	1.30	1.44	5.83	+
NE	1.95	1.80	124.01	3.50	376.88	4.90	12.04	+
FI	68.50	46.84	3.38	3.08	14.71	141.71	1.10	+
NC	11.40	9.94	31.80	4.96	14.70	14.98	1.10	+
AS	.97	.51	1.23	4.11	79.23	1.11	1.13	+
SE			2.87	5.10	4.39	1.06	.83	+
BR			2.26	1.00	1.90	.79	.16	+
MO			1.95	1.94	2.83	1.27	.60	+
CD			1.95	1.94	2.83	1.27	.60	+
SN			1.95	1.94	2.83	1.27	.60	+
SB			1.95	1.94	2.83	1.27	.60	+
DB	5.17	9.76	14.42	19.10	130.30	19.80	12.00	+

RORVIK	GROV FRAKTION		UGE NO: 11, 1980		NIIR FRAKTIONERING		*HV24 4	
	MAH NANOGRAM/KBM	TIR NANOGRAM/KBM	ONS NANOGRAM/KBM	TOR NANOGRAM/KBM	FRE NANOGRAM/KBM	LOR NANOGRAM/KBM	SUN NANOGRAM/KEM	
AL	44.80	57.10	53.50	86.80	73.90	42.00	44.40	+
SL	366.00	543.00	350.00	725.00	611.00	305.00	332.00	+
CL	608.00	900.00	888.00	910.00	421.00	215.00	122.00	+
KA	71.00	97.10	65.70	90.00	81.00	162.00	54.40	+
TV	49.31	93.40	76.64	174.00	681.00	173.00	121.00	+
CR	1.87	1.56	1.57	1.79	1.29	1.02	1.25	+
NE			4.54	1.99	14.61	5.10	1.25	+
FI	178.00	216.00	130.00	201.00	190.00	133.00	106.00	+
NC	1.00	1.89	1.04	1.02	6.43	8.10	7.78	+
AS	11.23	1.60	15.50	12.38	10.75	7.67	7.38	+
SE	.12	1.12	.10	1.13	.10	1.74	1.39	+
BR	1.20	1.09	1.29	3.28	2.18	1.74	1.39	+
MO		.23						+
CD			12.50	9.61	3.85	4.22	4.79	+
SN			6.81	7.67	6.45	4.22	4.79	+
SB			6.17	7.67	6.45	4.22	4.79	+
DB	13.60	12.40	12.60	9.61	3.85	4.22	4.79	+

*HV24 5

NIR FRAKTIONERING

UGE NO: 12, 1980

GRUV FRAKTION

RORVIK

PIXE:	MAH 17/ 3-80 NANOGRAM/KBM	TIR 18/ 3-80 NANOGRAM/KBM	ONS 19/ 3-80 NANOGRAM/KBM	TOR 20/ 3-80 NANOGRAM/KBM	FRE 21/ 3-80	LOR 22/ 3-80 NANOGRAM/KBM	SON 23/ 3-80 NANOGRAM/KBM
AL	39.70 +-21%	39.80 +-12%	91.10 +-15%	91.70 +-15%	*	36.40 +-20%	85.90 +-15%
SI	334.00 +-11%	332.00 +-10%	757.00 +-10%	698.00 +-10%	*	372.00 +-10%	582.00 +-10%
CL	58.20 +-12%	49.10 +-12%	100.00 +-11%	92.00 +-11%	*	71.30 +-11%	104.00 +-11%
KC	64.38 +-15%	57.04 +-14%	127.00 +-13%	180.00 +-13%	*	135.00 +-14%	106.00 +-14%
TI	1.21 +-35%	1.04 +-33%	1.66 +-26%	1.44 +-24%	*	1.52 +-22%	1.26 +-26%
TV	2.01 +-10%	1.09 +-10%	6.54 +-10%	4.00 +-10%	*	3.21 +-10%	4.20 +-10%
CR	72.50 +-35%	110.00 +-20%	247.00 +-32%	210.00 +-34%	*	107.00 +-31%	105.00 +-31%
FE	50 +-51%	1.17 +-20%	1.42 +-16%	1.25 +-17%	*	10.54 +-25%	11.10 +-24%
NI	7.45 +-51%	1.97 +-25%	12.60 +-16%	48.78 +-17%	*	1.54 +-25%	11.85 +-24%
CN	AS	SE	SR	OR	MC	HD	CU
AS	0.86 +-15%	0.83 +-16%	2.31 +-13%	1.80 +-13%	*	0.95 +-15%	1.93 +-13%
SR	*	*	0.40 +-39%	0.68 +-47%	*	0.19 +-48%	*
MC	*	0.09 +-40%	3.36 +-40%	1.90 +-34%	*	*	*
HD	*	*	1.64 +-40%	18.43 +-52%	*	*	*
CU	4.53 +-13%	9.65 +-12%	33.00 +-11%	18.70 +-11%	*	5.79 +-12%	8.07 +-12%

*HV24 6

NIR FRAKTIONERING

UGE NO: 13, 1980

GRUV FRAKTION

RURVIK

PIXE:	MAH 24/ 3-80 NANOGRAM/KBM	TIR 25/ 3-80 NANOGRAM/KBM	ONS 26/ 3-80 NANOGRAM/KBM	TOR 27/ 3-80 NANOGRAM/KBM	FRE 28/ 3-80 NANOGRAM/KBM	LOR 29/ 3-80 NANOGRAM/KBM	SON 30/ 3-80 NANOGRAM/KBM
AL	71.40 +-16%	56.80 +-12%	48.60 +-17%	83.70 +-15%	67.00 +-12%	79.60 +-10%	272.00 +-12%
SI	533.00 +-11%	452.00 +-10%	344.00 +-12%	523.00 +-12%	432.00 +-10%	374.00 +-10%	76.90 +-14%
CL	677.00 +-10%	382.00 +-10%	302.00 +-11%	1500.00 +-10%	650.00 +-10%	11.70 +-10%	22.50 +-10%
KC	87.10 +-11%	95.00 +-11%	116.00 +-12%	109.00 +-11%	68.70 +-12%	37.40 +-12%	76.90 +-14%
TI	11.20 +-13%	10.20 +-13%	6.19 +-15%	11.00 +-12%	11.70 +-13%	11.20 +-13%	39.50 +-14%
TV	2.70 +-26%	1.55 +-33%	1.55 +-50%	2.53 +-26%	1.23 +-29%	1.23 +-29%	1.19 +-30%
CR	15.44 +-14%	3.79 +-15%	2.00 +-16%	3.36 +-10%	1.00 +-10%	2.39 +-11%	4.05 +-14%
ME	183.00 +-10%	140.00 +-10%	111.00 +-10%	213.00 +-10%	191.00 +-10%	43.10 +-10%	47.74 +-11%
NI	1.25 +-33%	0.87 +-25%	0.81 +-30%	3.46 +-18%	1.00 +-15%	1.00 +-15%	10.20 +-14%
CN	14.00 +-11%	9.87 +-11%	6.82 +-11%	42.00 +-10%	23.70 +-10%	22.52 +-10%	10.72 +-14%
AS	11.12 +-39%	0.95 +-33%	0.07 +-52%	2.28 +-29%	1.11 +-32%	1.11 +-32%	0.63 +-17%
SR	1.92 +-13%	1.66 +-13%	1.13 +-14%	1.56 +-14%	3.25 +-16%	0.15 +-20%	0.63 +-17%
OR	1.28 +-39%	1.45 +-42%	*	3.68 +-24%	1.43 +-20%	0.15 +-53%	*
MC	6.00 +-38%	6.38 +-12%	4.98 +-13%	19.80 +-11%	5.48 +-47%	10.20 +-12%	4.38 +-50%
HD	8.00 +-12%	*	*	*	67.10 +-10%	*	10.30 +-12%
CU	*	*	*	*	*	*	*
DB	*	*	*	*	*	*	*

RORVIK	GROV FRAKTION		UGE NO: 14, 1980		NMR FRAKTIONERING		*HV24 7	
	MAN NANOGRAM/KBM	TIR NANOGRAM/KBM	ONS NANOGRAM/KBM	TOR NANOGRAM/KBM	FRE NANOGRAM/KBM	LOR NANOGRAM/KBM	SUN NANOGRAM/KBM	
AL	141.00	8.61	18.20	31.70	19.90	10.60	34.80	+25%
SI	267.00	148.00	238.00	51.00	252.00	198.00	359.00	+12%
SL	25.00	38.00	37.60	71.70	328.00	169.00	110.00	+12%
CK	11.00	32.30	67.70	8.70	42.00	50.20	34.00	+13%
CA	1.52	1.00	5.51	2.51	1.43	3.22	47.79	+14%
TI	7.75	3.21	3.04	3.92	1.88	2.11	71.00	+15%
VR	29.00	46.71	94.60	149.00	50.00	51.05	93.00	+16%
NE	1.72	0.4	1.51	1.68	1.00	1.89	1.00	+12%
FN	9.75	13.20	17.50	11.00	3.39	12.94	10.00	+19%
CN		0.44	0.46					+11%
AS		0.07	0.47					*
SE	.48	.42	1.89	2.15	.67	3.33	.92	+16%
RR			0.91	.23				*
SP			.15	.87				*
CO								*
NO								*
SN								+54%
SB								+42%
BA	10.00	5.23	16.00	13.60	4.89	8.87	15.50	+15%
PD								+11%

RORVIK	GROV FRAKTION		UGE NO: 15, 1980		NMR FRAKTIONERING		*HV24 8	
	MAN NANOGRAM/KBM	TIR NANOGRAM/KBM	ONS NANOGRAM/KBM	TOR NANOGRAM/KBM	FRE NANOGRAM/KBM	LOR NANOGRAM/KBM	SUN NANOGRAM/KBM	
AL	75.30	6.10	10.30	36.50	14.00	30.60	09.70	+15%
SI	110.00	264.00	201.00	335.00	139.00	367.00	883.00	+10%
SL	400.50	1550.00	1030.70	360.00	185.00	375.00	883.00	+11%
CK	78.00	59.00	55.00	44.00	44.00	40.00	100.00	+11%
CA	1.48	5.14	1.20	1.19	4.50	56.00	110.00	+12%
TI	1.31	1.02	1.09	1.78	1.36	1.64	1.00	+12%
VR	22.20	3.91	2.20	2.54	1.80	1.9	1.47	+13%
NE	4.26	8.10	5.70	6.4	34.00	20.97	1.94	+14%
FN	4.05	1.34	5.76	2.91	4.35	8.1	256.00	+14%
CN	3.41	8.22	6.85	4.27	4.30	7.91	1.70	+20%
AS		2.01		2.76	2.22	0	28.80	*
SE		1.30	1.01	1.36	1.63	3.17	4.23	+31%
RR		.20	1.16	1.36	1.13	1.36	2.50	+14%
CO								*
NO								*
SN								+46%
SB								*
BA	.54	5.10	6.34	3.15	2.65	10.90	6.17	+43%
PD							28.40	+11%

*HV24 9

NHR FRAKTIONERING

UGE NO: 16, 1980

GROV FRAKTION

SUN 20/ 4-80

LØR 19/ 4-80

FRE 18/ 4-80

TOR 17/ 4-80
NANOGRAM/KDM

ONS 16/ 4-80
NANOGRAM/KDH

TIR 15/ 4-80
NANOGRAM/KBM

MAN 14/ 4-80
NANOGRAM/KBM

AL	SI	CL	KA	TI	V	CR	ME	NI	ZH	AS	BR	SR	MO	CD	SN	SB	BA	P
72.00	150.00	185.00	125.00	117.00	164.00	53.00	3.57	7.63	550.00	2.16	36.90	2.81	31	6.80	1.45	19.20	33.00	
+14%	+11%	+10%	+13%	+11%	+10%	+17%	+34%	+14%	+10%	+10%	+41%	+11%	*	+11%	+39%	+23%	+11%	
195.00	1470.00	1070.00	200.00	192.00	39.00	5.54	13.50	1585.57	5.00	4.55	6.67	2.48	2.30	21.00	14.20	36.20		
+15%	+11%	+10%	+10%	+11%	+12%	+29%	+44%	+14%	+17%	+10%	+32%	*	+12%	+49%	*	+39%	+51%	+11%
165.00	1490.00	685.00	178.00	152.00	31.89	1.89	8.11	1.56	385.56	2.50	1.82	3.71	4.48	1.56	8.34	24.10		
+13%	+10%	+10%	+12%	+11%	+11%	+46%	+13%	+10%	+37%	+17%	+46%	+32%	+12%	+35%	*	+33%	+11%	
39.20	325.00	469.00	21350.00	120.00	1.05	1.05	6.11	100.00	1.40	9.75	4.62	2.02	1.12	9.26				
+24%	+13%	+11%	+10%	+11%	+15%	+34%	+14%	+13%	+21%	+11%	+34%	+14%	+30%	+12%	*	*	*	*

PIXE:

VIROLAHTI FIN FRAKTIOH		UGE NO: 11, 1980		NHR FRAKTIONERING		*HV24 1	
MAH 10/ 3-80	TIR 11/ 3-80	ONS 12/ 3-80	TOR 13/ 3-80	FRE 14/ 3-80	LOR 15/ 3-80	SUN 16/ 3-80	
				NANOGRAM/KBM	NANOGRAM/KBM	NANOGRAM/KBM	
S-04	*	*	*	1400.00	1610.00	2120.00	*
NC-03	*	*	*	651.20	450.00	1355.70	*
CA	*	*	*	514.00	47.50	135.00	*
KEHI:							
PIXE:							
AL	*	*	*	09.40	89.10	17.10	50%
SI	*	*	*	684.00	759.00	170.00	+10%
SCL	*	*	*	594.00	1659.40	237.50	+10%
KCA	*	*	*	257.00	284.75	57.00	12%
TI	*	*	*	455.29	156.00	269.00	+10%
V	*	*	*	15.18	11.50	1.74	15%
CR	*	*	*	1.10	1.30	1.37	23%
ME	*	*	*	16.00	13.90	1.10	15%
NI	*	*	*	212.74	125.00	6.25	+10%
CU	*	*	*	12.20	32.00	09.73	30%
ZN	*	*	*	12.20	32.00	1.69	10%
AS	*	*	*	23.30	22.30	124.00	10%
SE	*	*	*	1.47	1.57	7.87	34%
BR	*	*	*	1.34	3.0	7.72	36%
RB	*	*	*	1.47	1.57	3.8	37%
SR	*	*	*	1.30	1.57	3.8	15%
MO	*	*	*	44.90	11.10	37.00	+10%
CD	*	*	*	3600.00	2100.00	3300.00	+10%
SN	*	*	*				
SB	*	*	*				
DA	*	*	*				
PB	*	*	*				
EMEP:							
S-04	*	*	*	3600.00	2100.00	3300.00	

VIROLAHTI		FIN FRAKTION		UGE NO: 12, 1980		NMR FRAKTIONERING		*HV24 2	
		TIR 18/3-80	ONS 19/3-80	TOR 20/3-80	FRE 21/3-80	LOR 22/3-80	SON 23/3-80		
		NANOGRAM/KBM	NANOGRAM/KBM	NANOGRAM/KBM	NANOGRAM/KBM	NANOGRAM/KBM	NANOGRAM/KBM		
S-04	1960.00	*	1960.00	1870.00	1880.00	2010.00	3410.00	*	*
MG	53.00	*	186.50	120.00	133.50	221.00	220.00	*	*
CA	64.20	*	188.00	154.00	84.70	40.80	99.80	*	*
	232.00	*				134.00	275.00	*	*
KEMI:									
AL	42.30	+50%	192.00	41.10	40.40	62.90	62.00	+50%	+50%
SI	240.00	+12%	1920.00	480.00	350.00	2540.00	4520.00	+12%	+12%
SK	56.00	+17%	1370.00	94.10	65.70	67.00	142.00	+17%	+17%
CA	73.30	+12%	161.00	27.40	19.80	51.40	113.00	+12%	+12%
TI	3.67	+24%	112.50	3.57	5.50	9.32	13.60	+24%	+15%
Y	4.84	+35%	112.00	4.78	1.50	9.32	13.60	+35%	+18%
CH	1.80	+25%	228.00	1.80	1.20	7.10	13.60	+25%	+18%
FE	1.02	+10%	228.00	1.80	1.20	7.10	13.60	+10%	+10%
NI	1.00	+10%	228.00	1.80	1.20	7.10	13.60	+10%	+10%
CU	3.46	+21%	27.70	3.30	1.50	4.30	15.20	+21%	+21%
AS	3.50	+19%	27.70	3.30	1.50	4.30	15.20	+19%	+19%
SE	5.49	+32%	27.70	3.30	1.50	4.30	15.20	+32%	+10%
BR	6.05	+24%	8.07	15.00	10.60	14.00	24.80	+24%	+15%
RB	.54	+40%	1.47	.64	.44	1.04	1.33	+40%	+15%
SR	.46	+25%	.41	.48	.44	1.04	1.33	+25%	+15%
WO	.44	+37%	.41	.48	.44	1.04	1.33	+37%	+15%
CO	2.75	+36%	2.45	2.27	1.49	2.23	2.01	+36%	+44%
SN	2.32	+46%	2.45	2.27	1.49	2.23	2.01	+46%	+44%
SB	26.40	+10%	53.70	71.20	45.80	49.50	43.80	+10%	+10%
BP									
EMEP:									
S-04	4100.00	*	4900.00	4800.00	1800.00	5400.00	7200.00	*	*

VIROLAHTI FIN FRAKTION		UGE NO: 13, 1980		NIIR FRAKTIONERING		*HV24 3	
MAH 24/3-80	TIR 25/3-80	ONS 26/3-80	TOR 27/3-80	FRE 28/3-80	LOR 29/3-80	SON 30/3-80	
NANOGRAM/KBM	NANOGRAM/KBM	NANOGRAM/KBM	NANOGRAM/KBM	NANOGRAM/KBM	NANOGRAM/KBM	NANOGRAM/KBM	
S-04	2860.00	1810.00	3130.00	3430.00	3480.00	2430.00	
MC	332.00	255.00	787.50	275.80	320.00	138.10	
CA	68.60	51.60	47.50	45.80	47.80	38.00	
	104.00	189.00	152.00	211.00	261.00	136.00	
KEMI:							
AL	61.10	75.30	30.00	39.10	52.80	35.00	59%
SL	510.00	462.00	300.00	336.00	470.00	250.00	14%
CK	1832.00	2126.00	3640.00	4078.00	4581.00	3128.00	17%
CT	240.00	178.00	120.00	217.00	245.00	187.00	17%
TY	415.00	308.00	140.00	129.00	195.00	86.70	14%
YCR	15.84	14.80	7.59	13.00	11.50	4.95	1%
MFEI	4.32	7.16	9.24	9.81	9.50	5.20	4%
NUN	181.00	150.00	140.00	183.00	193.00	108.00	16%
ZNS	2.78	3.40	3.00	3.00	3.11	4.54	18%
ASS	17.60	42.00	31.00	43.00	45.00	29.00	20%
SER	20.90	5.00	7.00	15.00	10.00	2.00	16%
BRB	1.33	1.00	1.00	1.00	1.00	2.00	36%
SR	1.26	1.00	1.00	1.00	1.00	1.00	17%
MOD	2.04			3.05	3.05	1.87	44%
SN				3.40	3.40	1.87	44%
SB				36.30	36.30	19.90	55%
BA	26.60	19.80	30.60	36.30	36.20	19.90	10%
PB							
EMEP:							
S-04	8300.00	4900.00	7800.00	11600.00	9700.00	5800.00	

VIROLAHTI		FIN FRAKTION		UGE NO: 15, 1980		NUR FRAKTIONERING		*HV24 5	
	7/4-80	8/4-80	9/4-80	10/4-80	11/4-80	12/4-80	13/4-80		
	NANOGRAM/KBM	NANOGRAM/KBM	NANOGRAM/KBM	NANOGRAM/KBM	NANOGRAM/KBM	NANOGRAM/KBM	NANOGRAM/KBM		
S-04	260.00	1919.00	840.00	750.00	840.00	510.00	510.00	750.00	
MG	121.00	1989.00	248.00	130.00	205.00	190.00	190.00	123.00	
CA	36.80	47.30	30.10	19.90	30.30	37.10	37.10	46.30	
	151.00	169.00	100.00	99.50	101.00	135.00	135.00	106.00	
KEMI:									
AL	39.80	21.30	18.10	16.50	98.60	33.10	33.10	16.90	50%
SI	158.00	160.00	97.00	230.00	137.00	97.50	97.50	62.00	+26%
CL	484.50	1441.00	1450.00	49.00	1330.00	035.00	035.00	1125.00	+18%
KA	139.00	140.00	96.60	61.00	64.10	79.10	79.10	43.70	+14%
TI	122.00	154.50	19.60	20.00	69.20	20.10	20.10	12.50	+22%
V	3.01	5.40	3.22	3.38	22.00	4.27	4.27	4.61	+20%
CR	1.15	1.99	7.42	1.00	1.33	1.51	1.51	18.00	
FE	52.90	31.10	49.30	30.00	43.40	20.99	20.99	2.48	+12%
NI	1.04	1.61	1.66	1.99	2.76	1.70	1.70	2.48	+11%
CU	7.83	20.90	11.00	41.90	16.70	13.60	13.60	16.87	+10%
ZN									
AS									
SE	7.41	0.23	3.57	3.93	5.43	0.08	0.08	6.69	+20%
BR	.92	.47	.31	.16	.28	.49	.49	.40	+48%
SR	.58	.14	.20	.35	.54	.37	.37	.33	+27%
NO									
MO									
SN									
SB									
BB	18.70	29.90	15.50	27.70	24.60	25.30	25.30	34.20	+10%
EMEP:									
S-04	600.00	2400.00	1900.00	1400.00	1600.00	800.00	800.00	1000.00	

VIROLAHTI		FIN FRAKTIOII		UGE NO: 16, 1980		NIIR FRAKTIOIJERING		*HV24 6	
IAN 14/ 4-80	TIR 15/ 4-80	ONS 16/ 4-80	TOP 17/ 4-80	FRF 18/ 4-80	LOR 19/ 4-80	SUN 20/ 4-80			
MANOGRAM/KBM	MANOGRAM/KBM	MANOGRAM/KBM	MANOGRAM/KBM	MANOGRAM/KBM	MANOGRAM/KBM	MANOGRAM/KBM			
KEMI:	340.00	260.00	260.00	230.00	1180.00	600.00			
S-04	88.00	177.00	240.00	234.00	1185.00	138.00			
MG	51.00	30.30	44.30	37.20	33.70	127.00			
CA	170.00	68.30	119.00	59.20	50.60	101.00			
PIXE:									
AY	28.20	21.30	95.70	95.90	17.70	134.00			
SL	138.00	144.00	482.00	516.00	17.60	136.00			
CK	61.50	148.00	63.60	127.00	995.00	906.00			
CA	25.20	64.00	79.60	90.70	74.50	144.00			
TV		48.50	79.99	8.86	1.32	12.15			
CR		3.09	10.37	6.13	1.84				
PN		1.88	14.50	6.79	1.88	3.92			
FN	23.60	49.39	207.50	204.00	34.69	102.00			
NC		1.50	57.10	52.10	1.64	1.04			
UN	5.71	13.50	57.10	32.37	30.40	8.40			
ASE									
SE	6.24	6.57	3.38	4.24	2.40	12.42			
BR									
SR	.22	.31	2.08	1.87	.35	1.80			
MO									
CD									
SN									
SB									
PA	17.20	15.50	21.50	22.70	17.20	8.03			
FMEP:									
S-04	600.00	1900.00	2000.00	2100.00	2500.00	1400.00			

PERCENTAGE CHANGES: +50%, +21%, +19%, +13%, +23%, +36%, +11%, +25%, +10%, +21%, +33%, +21%, +47%, +27%, +34%, +33%, +10%, +22%, +37%, +18%, +12%, +36%, +30%, +10%, +37%, +22%, +16%, +45%, +45%, +11%

VIROLAHTI FIN FRAKTIOH		UGE NO: 18, 1980		NIIR FRAKTIOHERING			*HV24 8	
	MAN 28/ 4-80 NANOGRAM/KBM	TIR 29/ 4-80 NANOGRAM/KBM	ONS 30/ 4-80 NANOGRAM/KBM	TOR 1/ 5-80 NANOGRAM/KBM	FRE 2/ 5-80 NANOGRAM/KBM	LOR 3/ 5-80 NANOGRAM/KBM	SOR 4/ 5-80 NANOGRAM/KBM	
S-04	1080.00	770.00	1090.00	540.00	449.00	590.00	529.00	*
N-03	132.00	155.00	230.00	40.00	37.00	70.00	53.00	*
HG	41.50	43.50	33.00	23.10	33.80	29.90	26.40	*
CA	166.00	84.50	133.00	110.00	169.00	146.00	126.00	*
KEMI:								
AL	35.50	48.00	75.30	44.00	79.50	86.70	58.10	+50%
SI	230.00	282.00	1280.00	145.00	537.00	675.00	416.00	+110%
CL	1179.00	891.40	1384.00	745.00	581.60	756.30	653.30	+23%
CK	60.00	57.80	135.00	24.90	71.10	78.30	54.30	+12%
CA	42.94	46.32	127.38	19.10	1.26	50.02	43.53	+16%
CT	4.74	3.22	3.15		1.14			+49%
V	4.13	1.22						*
CR	5.57	1.62	4.47	22.00	2.50	4.76	5.83	+20%
ME	12.55	8.30	1.75		0.89	120.00	107.00	+11%
NI	2.80	1.29	1.19		.89			+32%
CU	1.90	11.20	24.70	4.33	7.33	14.10	1.05	+12%
CN	67.00			1.30				+33%
AS				3.01	4.09	3.16	2.85	+37%
SE	17.34	2.20	4.12					+26%
BR		.40	1.72	.26	.52	.75	.37	+19%
RR	.57	.64	1.07		.58		.20	+48%
MO								*
CD		1.03						+49%
SN								*
SB								*
BP	17.40	7.72	15.10	3.26	6.40	9.54	9.25	+10%
EMEP:								
S-04	1900.00	1200.00	2200.00	700.00	600.00	900.00	800.00	+11%

VIROLAHTI		GROV FRAKTION		UGE NO: 11, 1980		NHR FRAKTIONERING		*HV24 1					
HAN 10/ 3-80		TIR 117 3-80		ONS 12/ 3-80		TOR 13/ 3-80		FRE 14/ 3-80		LØR 15/ 3-80		SØN 16/ 3-80	
KEMI:													
S-04	*	*	*	*	*	*	*	860.00	*	300.00	*	330.00	*
N-03	*	*	*	*	*	*	*	255.00	*	125.00	*	27.00	*
HG	*	*	*	*	*	*	*	174.00	*	54.20	*	22.60	*
CA	*	*	*	*	*	*	*	1850.00	*	295.00	*	152.00	*
PIXE:													
AL	*	*	*	*	*	*	*	319.00	+50%	185.00	+50%	22.00	+50%
SI	*	*	*	*	*	*	*	220.00	+10%	225.00	+10%	380.00	+10%
SCL	*	*	*	*	*	*	*	60.00	+11%	47.00	+11%	20.00	+11%
KCA	*	*	*	*	*	*	*	700.00	+10%	335.00	+10%	12.00	+10%
CTI	*	*	*	*	*	*	*	1200.00	+11%	19.00	+11%	99.00	+11%
TVCR	*	*	*	*	*	*	*	43.50	+35%	1.00	+35%	7.00	+35%
PLI	*	*	*	*	*	*	*	97.00	+13%	7.00	+13%	6.00	+13%
HCU	*	*	*	*	*	*	*	757.00	+10%	7.00	+10%	1.00	+10%
ZAS	*	*	*	*	*	*	*	2.00	+35%	3.00	+35%	8.00	+35%
SEK	*	*	*	*	*	*	*	12.00	+11%	1.00	+11%	1.00	+11%
BRD	*	*	*	*	*	*	*	1.00	+49%	1.00	+49%	1.00	+49%
SIR	*	*	*	*	*	*	*	4.00	+13%	4.00	+13%	1.00	+13%
MO	*	*	*	*	*	*	*	4.00	+14%	3.00	+14%	1.00	+14%
CD	*	*	*	*	*	*	*	4.00	+12%	3.00	+12%	1.00	+12%
SN	*	*	*	*	*	*	*	4.00	+12%	3.00	+12%	1.00	+12%
SB	*	*	*	*	*	*	*	4.00	+12%	3.00	+12%	1.00	+12%
BA	*	*	*	*	*	*	*	18.00	+24%	16.70	+24%	14.80	+24%
PB	*	*	*	*	*	*	*	17.00	+11%	17.00	+11%	14.80	+11%

VIROLAHTI		GROY FRAKTION		UGE NU: 13, 1980		N:IR FRAKTIONERING		*HV24 3						
S-04	120.00	* * *	TIR 25/ 3-80	* * *	ONS 26/ 3-80	* * *	TOR 27/ 3-80	* * *	FRE 28/ 3-80	* * *	LUR 29/ 3-80	* * *	SUN 30/ 3-80	* * *
NG	34.00	* * *	NAHOGRAM/KDM	1900.00	384.00	1240.00	836.00	2100.00	1850.00	1079.00	370.00	1079.00	553.00	NAHOGRAM/KDM
CA	96.00	* * *	NAHOGRAM/KDM	332.00	31.00	1439.00	226.70	2100.00	2000.00	2100.00	183.00	183.00	22.00	NAHOGRAM/KDM
	549.00	* * *	NAHOGRAM/KDM	3730.00	268.00	1380.00	14.73	2100.00	2100.00	2100.00	801.00	801.00	180.00	NAHOGRAM/KDM
KEHI:														
PIXE:														
AL	341.00	+50%		370.00	50%	154.00	97.00	8.00	2100.00	50%	119.00	119.00	56.30	+50%
SI	400.00	+10%		3630.00	+10%	1240.00	836.00	2100.00	1850.00	+10%	1079.00	1079.00	553.00	+10%
SL	47.90	+17%		2580.00	+17%	1439.00	226.70	2100.00	2000.00	+17%	183.00	183.00	22.00	+17%
CA	654.00	+10%		333.00	+10%	1380.00	14.73	2100.00	2100.00	+10%	333.00	333.00	147.00	+10%
TI	55.90	+11%		1460.00	+11%	280.00	14.73	2100.00	2100.00	+11%	146.00	146.00	1.75	+11%
TV	3.05	+44%		61.50	+44%	5.00	1.40	2100.00	2100.00	+44%	61.50	61.50	1.38	+44%
CR				3.20		1.00	1.40	2100.00	2100.00		3.20	3.20	3.22	
NN	11.00	+13%		15.50	+13%	5.00	6.74	2100.00	2100.00	+13%	15.50	15.50	118.00	+13%
FN	3.41	+22%		4.20	+22%	2.70	1.00	2100.00	2100.00	+22%	4.20	4.20	1.51	+22%
CUN	1.33	+29%		1.60	+29%	1.00	1.00	2100.00	2100.00	+29%	1.60	1.60	6.51	+29%
ZAS	19.40	+10%		17.00	+10%	16.70	16.70	2100.00	2100.00	+10%	17.00	17.00	6.72	+10%
AS	1.34	+45%		3.05	+45%	1.70	1.70	2100.00	2100.00	+45%	3.05	3.05	5.41	+45%
SR	1.20	+21%		20.00	+21%	.80	9.41	2100.00	2100.00	+21%	2.40	2.40	5.41	+21%
RR	4.22	+13%		6.00	+13%	.84	3.57	2100.00	2100.00	+13%	4.00	4.00	1.53	+13%
SK	5.04	+12%		11.00	+12%	5.15	7.83	2100.00	2100.00	+12%	4.00	4.00	1.53	+12%
HO														
CD														
SM														
SB	13.50	+31%		20.70	+31%	19.61	6.55	6.60	6.60	+31%	6.15	6.15	6.20	+31%
BP	4.00	+11%		13.00	+11%	12.00	10.60	10.60	10.60	+11%	8.00	8.00	4.00	+11%

VIOLAHTI		GROV FRAKTION		UGE NO: 17, 1980		NIIR FRAKTIONERING		*HIV24 7	
	MAH 21/ 4-80 NANOGRAM/KBM	TIP 22/ 4-80 NANOGRAM/KDM	ONS 23/ 4-80 NANOGRAM/KBII	TOR 24/ 4-80 NANOGRAM/KDM	FRE 25/ 4-80 NANOGRAM/KBM	HOR 26/ 4-80 NANOGRAM/KDM	SUN 27/ 4-80 NANOGRAM/KEM		
KEMI:									
S-04	230.00	120.00	340.00	500.00	390.00	260.00	240.00		
N-03	27.00	20.00	31.00	23.00	121.00	46.30	27.00		
NG	20.00	19.00	20.40	26.00	68.10	39.30	37.00		
CA	10.00	13.10	10.20	16.00	649.00	296.00	156.00		
PIXE:									
AL	27.30	47.70	45.50	89.10	352.00	98.80	124.00		
SI	297.00	322.00	400.00	892.00	379.00	896.00	1420.00		
SL	138.00	117.00	351.00	169.00	313.00	292.00	1229.00		
KA	14.50	14.70	14.90	73.10	328.00	96.00	146.00		
TI	29.50	69.80	65.20	126.00	886.00	321.00	201.00		
VI	4.55	4.97	5.07	11.10	13.60	11.40	11.55		
VR	1.38			1.10					
CR	1.33	32	2.10	3.16	40	4.32	6.65		
RH	1.00	1.39	117.00	13.30	12.00	247.00	206.00		
FE	100.00	93.98	1.00	186.00	752.48	1.56	1.00		
CO	6.02	4.34	1.94	5.17	2.25	1.34	1.61		
ZN	8.15	4.46	10.10	11.10	14.80	10.80	18.20		
AS				1.5	1.09	.54			
SE	.72		1.58	.15	2.38	.63	7.9		
BR		38	.52	2.30	2.51	.86	1.44		
SK	.71	1.30	.89	10.50	10.50	2.76	2.20		
NO			.24						
CD									
SH									
SD									
DA	5.05	6.14	3.41	5.05	12.40	5.05	5.33		
				5.98		4.23	5.24		

VIROLAHTI		GROV FRAKTION		UGE NO: 10, 1980		NIIR FRAKTIONERING		*HV24 8	
	HAH 28/4-80 MAGROGRAM/KBM	TIF 29/4-80 MAGROGRAM/KBM	ONS 30/4-80 MAGROGRAM/KBM	TOP 1/5-80 MAGROGRAM/KBM	FRE 2/5-80 MAGROGRAM/KBM	HUR 3/5-80 MAGROGRAM/KBM	SUN 4/5-80 MAGROGRAM/KBM		
KEMI:									
S-04	150.00	124.00	230.00	30.00	69.00	50.00	54.00	*	*
N-03	26.00	54.00	100.00	10.00	16.90	23.00	13.00	*	*
MG	30.20	37.20	390.00	83.70	101.00	93.00	85.10	*	*
CA	166.00	186.00						*	*
PIXE:									
AL	47.20	69.10	312.00	29.10	42.20	85.60	33.00	+50%	+50%
SI	485.00	691.00	3670.00	436.90	574.00	1020.00	400.00	+12%	+12%
CL	152.00	117.00						+15%	+15%
K	48.70	71.30	16.60	37.30	35.00	18.40	17.20	+12%	+12%
CA	50.00	100.00	328.00	39.30	69.40	69.00	35.60	+12%	+12%
TI	135.57	7.14	29.30	3.43	3.99	9.62	55.70	+14%	+14%
V	1.14							*	*
CH	6.31	2.21	5.67	0.91	1.27	3.51	3.40	+16%	+16%
PE	139.00	176.00	601.00	53.60	79.00	169.00	91.00	+10%	+10%
NI	87		1.71					*	*
CUN	48	84	1.53	1.32	37	38	53	+43%	+43%
AS	29.30	3.99	9.50	1.49	2.06	4.30	10.33	+11%	+11%
SE								*	*
RR	37	76	1.49	0.96	70	61	46	+32%	+32%
SR	48	75	3.52	3.7	56	87	59	+21%	+21%
MO	1.69	1.98	4.90	3.33	63	1.00	17	+15%	+15%
DD								*	*
CS								*	*
SA								*	*
PP	5.68	1.91	14.40	0.07	4.28	2.19	2.80	+13%	+13%
								+17%	+17%
								+33%	+33%
								+50%	+50%
								+17%	+17%
								+47%	+47%
								+53%	+53%
								+14%	+14%

VIROLAHTI		GROV FRAKTION		UGE NO: 19, 1980		NHR FRAKTIONERING		LUR 10/ 5-00		*HV24 5	
		MAH 5/ 5-80		TIR 6/ 5-80		ONS 7/ 5-80		TOR 8/ 5-80		FRE 9/ 5-80	
		NANOGRAM/KBM		NANOGRAM/KBM		NANOGRAM/KBM		NANOGRAM/KUH		NANOGRAM/KBN	
S-04	129.00	*	130.00	*	1190.00	*	920.00	*	170.00	*	*
M-03	54.00	*	33.00	*	250.00	*	142.00	*	85.00	*	*
H6	33.80	*	29.00	*	297.00	*	89.10	*	40.70	*	*
CA	179.00	*	146.00	*	3030.00	*	830.00	*	170.00	*	*
KEMI:											
AL	213.00	+50%	245.00	+50%	547.00	+50%	162.00	+50%	77.40	+50%	*
SS	280.00	+10%	260.00	+10%	5076.00	+10%	1440.00	+11%	869.00	+11%	*
CL	109.00	+13%	100.00	+13%	876.00	+10%	1020.00	+10%	140.00	+12%	*
KCA	33.00	+10%	21.00	+10%	213.00	+12%	95.50	+11%	94.70	+13%	*
TI	220.00	+12%	193.00	+12%	3330.00	+11%	314.00	+10%	98.00	+11%	*
V	23.00	*	123.70	*	56.00	*	110.00	+3%	8.18	+15%	*
CR	6.08	+15%	3.57	+10%	0.00	+53%	12.21	+46%		*	*
PH	434.00	+10%	431.00	+10%	8.22	+16%	6.89	+14%	1.76	+21%	*
NI	2.94	+33%	1.43	+45%	1090.00	+48%	363.55	+39%	166.00	+10%	*
CN	1.20	+25%	1.02	+32%	1.32	+11%	1.42	+3%	3.43	+36%	*
AS	12.20	+11%	5.11	+15%	9.11	+11%	10.40	+15%		+12%	*
SR	66	+31%	43	+26%	10.10	+11%	78	+25%	1.12	+22%	*
RR	3.25	+15%	3.52	+14%	10.49	+14%	5.22	+15%	1.91	+21%	*
NO	3.76	+12%	3.00	+12%	10.72	+11%	4.03	+12%	1.34	+14%	*
CO		*		*		*		*		*	*
SD		*		*		*		*		*	*
SB		*		*		*		*		*	*
PA	12.30	+20%	13.90	+26%	25.00	+22%	5.57	+41%	5.22	+40%	*
PB	4.75	+13%	3.13	+15%	5.63	+15%	4.97	+11%	4.14	+13%	*

APPENDIX 2

Average sectoral concentrations of air pollutants at
Birkenes, Rörvik and Virolahti

The numbers are listed after station, fraction and element. The station names BIR, RVK and SF7 correspond to Birkenes, Rørvik and Virolahti. A/B after the station name correspond to coarse/fine particles.

The fifth sector "UBEST" are those measurements, which could not be assigned to a sector because the air mass passed over more than one sector. The numbers in the first two columns after the sector assignment are the total number of measurements corresponding to the sector and the number of measurements above the detection limit. In the two next columns are the average concentrations and the standard deviations. The three last columns are the 50, 75 and 90 percentiles.

All concentrations are in ng/m^3 .

The elements measured with PIXE are listed under their atomic symbol.

S4 = S(O₄)
 N3 = N(O₃)
 C2 = Ca measured with AAS
 PN = Pb " " "
 SX = S(O₄) EMEP values
 S2 = S(O₂) " "

83 JAN 20-13:22:08 21-00001 DATE 233083

*** PIX*MAP (1) 5-NGA/A(U) ***

ELT PIX*MMR(1) 5-NGA/A(U) AT 3882 FROM 83 JAN 20-13:22:08.
SEKTOR AHTAL .GTR.G MIDDEL SPRED.A.- FRAKTIL:

STOF:	DIR	A	270380	U70680	50	75	90
1: STOF: A	HW	21	131	129	39.9	79.6	132.
2: STOF: A	NE	13	145	149	62.9	146.	131.
3: STOF: A	SE	10	167	181	33.9	444.	-1.00
4: STOF: A	SW	3	86.5	121.	27.5	101.	-1.00
5: STOF: A	UDEST.	19	113.	120.	94.9	118.	-1.00
6: STOF: S	HW	21	131	129	173.	329.	596.
7: STOF: S	NE	13	145	149	299.	579.	636.
8: STOF: S	SE	10	167	181	111	161	-1.00
9: STOF: S	SW	3	86.5	121.	206.	393.	-1.00
10: STOF: S	UDEST.	19	113.	120.	405.	532.	-1.00
11: STOF: C	HW	16	194.8	307.1	136.	152.	309.
12: STOF: C	NE	11	33.8	35.50	92.5	174.	257.
13: STOF: C	SE	1	1.45	3.50	175.	642.	-1.00
14: STOF: C	SW	4	30.8	80.9	191.	505.	-1.00
15: STOF: C	UDEST.	5	50.0	119.	92.1	125.	-1.00
16: STOF: K	HW	21	37.6	28.6	42.9	228.8	917.
17: STOF: K	NE	13	60.8	38.0	24.7	40.8	59.
18: STOF: K	SE	10	90.1	92.0	0.0	0.0	-1.00
19: STOF: K	SW	3	35.2	34.0	0.0	9.24	-1.00
20: STOF: K	UDEST.	9	67.0	70.5	9.41	14.3	-1.00
21: STOF: CA	HW	21	50.8	40.9	23.4	58.5	72.8
22: STOF: CA	NE	13	83.4	80.5	33.6	105.	107.
23: STOF: CA	SE	10	29.4	27.8	33.2	101.	-1.00
24: STOF: CA	SW	3	70.4	127.8	45.9	79.1	-1.00
25: STOF: CA	UDEST.	9	70.4	54.8	49.9	56.7	-1.00
26: STOF: TI	HW	21	5.00	4.33	34.9	76.5	138.
27: STOF: TI	NE	13	8.45	6.45	50.7	105.	129.
28: STOF: TI	SE	10	22.3	20.0	448.	448.	-1.00
29: STOF: TI	SW	3	8.12	13.0	23.9	53.7	-1.00
30: STOF: TI	UDEST.	9	10.4	10.8	63.7	83.7	-1.00
31: STOF: V	HW	4	258	580	3.31	87.8	11.4
32: STOF: V	NE	13	194	470	3.90	10.4	18.00
33: STOF: V	SE	10	307	477	6.2	45.6	-1.00
34: STOF: V	SW	3	357	709	2.75	8.50	-1.00
35: STOF: V	UDEST.	1	990-c1	297	8.80	10.1	-1.00
36: STOF: CR	HW	5	328	673	0.0	0.0	1.31
37: STOF: CR	NE	4	237	373	0.0	0.0	1.00
38: STOF: CR	SE	2	1.11	2.37	0.0	0.0	-1.00
39: STOF: CR	SW	1	1.11	2.37	0.0	0.0	-1.00
40: STOF: CR	UDEST.	1	1.11	2.37	0.0	0.0	-1.00

*** FIX*NMPL(1) 5-NGA/A(1) *** 83 JAN 20-13:22:08 21-UUUUU DATE W33283

126:	4	SW	UBEST.	19	895	1.33	1.35	.715	1.825	-1.00	-1.00
127:	9	UBEST.		8	1.13						
128:											
129:	STOF:	MJ	STATION:	BIR A	270380	U70680					
130:	1	HW		0	000	000	000	000	000	000	000
131:	2	HE		0	000	000	000	000	000	000	000
132:	3	SE		0	000	000	000	000	000	000	000
133:	4	SW		0	100	001	582	000	000	000	000
134:	9	UBEST.		0	000	000	000	000	000	000	000
135:											
136:	STOF:	BA	STATION:	BIR A	270380	U70680					
137:	1	HW		4	1.15	2.41	000	000	000	000	000
138:	2	HE		3	1.34	2.54	000	000	000	000	000
139:	3	SE		2	1.36	6.25	000	000	000	000	000
140:	4	SW		2	1.76	4.08	000	000	000	000	000
141:	9	UBEST.		2	1.75	3.76	000	000	000	000	000
142:											
143:	STOF:	PB	STATION:	BIR A	270380	U70680					
144:	1	HW		21	2.54	0.36	000	000	000	000	000
145:	2	HE		18	2.53	3.24	000	000	000	000	000
146:	3	SE		16	1.13	0.60	000	000	000	000	000
147:	4	SW		19	4.96	5.65	000	000	000	000	000
148:	9	UBEST.		19	2.34	5.75	000	000	000	000	000
149:											
150:	STOF:	SA	STATION:	BIR A	270380	U70680					
151:	1	HW		21	129.	146.	000	000	000	000	000
152:	2	HE		19	148.	133.	000	000	000	000	000
153:	3	SE		16	368.	403.	000	000	000	000	000
154:	4	SW		19	90.0	49.1	000	000	000	000	000
155:	9	UBEST.		19	2.34	5.75	000	000	000	000	000
156:											
157:	STOF:	PS	STATION:	DIR A	270380	U70680					
158:	1	HW		13	30.0	2.7	000	000	000	000	000
159:	2	HE		19	109.	159.	000	000	000	000	000
160:	3	SE		4	109.	184.	000	000	000	000	000
161:	4	SW		4	192.0	19.1	000	000	000	000	000
162:	9	UBEST.		4	20.0	19.1	000	000	000	000	000

63:	4	SW	10	4	452	600	000	025	-1:00
64:	9	UDEST.		2	132	350		050	
65:	STOP:	NI	STATION:	BIR D	270380	070680			
66:	1	NW	10	21	4.49	3.68	3.00	6.67	11.5
67:	2	NE	10	10	5.90	4.40	3.00	7.40	9.1
68:	3	SW	10	10	4.70	3.70	3.00	5.40	-1:00
69:	4	SE	10	10	4.16	3.00	3.00	5.50	-1:00
70:	9	UDEST.		9	5.00	5.90		4.50	
71:	STOP:	FE	STATION:	BIR D	270380	070680			
72:	1	NW	10	21	25.2	24.5	15.7	39.9	67.1
73:	2	NE	10	10	43.4	24.9	17.0	47.4	87.0
74:	3	SW	10	10	89.7	62.0	32.0	140.0	-1:00
75:	4	SE	10	10	40.6	44.7	32.0	62.0	-1:00
76:	9	UDEST.		9	58.1	39.9	57.0	71.1	
77:	STOP:	NI	STATION:	BIR D	270380	070680			
78:	1	NW	10	15	2.09	3.50	1.20	2.00	5.42
79:	2	NE	10	10	1.70	1.00	1.00	2.00	4.60
80:	3	SW	10	10	2.15	1.17	1.00	2.00	-1:00
81:	4	SE	10	9	1.67	1.20	1.00	2.00	-1:00
82:	9	UDEST.		9	1.38	1.91	1.00	1.00	
83:	STOP:	CU	STATION:	BIR D	270380	070680			
84:	1	NW	10	0	3.84	6.13	0.00	2.00	1.71
85:	2	NE	10	0	1.25	2.50	0.00	0.00	1.45
86:	3	SW	10	0	2.34	2.00	0.00	0.00	-1:00
87:	4	SE	10	0	1.22	1.75	0.00	0.00	-1:00
88:	9	UDEST.		9	1.45	1.94	0.00	0.00	
89:	STOP:	ZI	STATION:	BIR D	270380	070680			
90:	1	NW	10	21	7.75	8.20	4.00	11.8	20.0
91:	2	NE	10	10	3.5	15.0	1.00	17.0	24.0
92:	3	SW	10	10	18.7	18.0	1.00	17.0	-1:00
93:	4	SE	10	9	7.55	12.77	1.00	17.0	-1:00
94:	9	UDEST.		9			0.00	0.00	
95:	STOP:	AS	STATION:	BIR B	270380	070680			
96:	1	NW	10	14	6.80	6.42	7.77	1.19	1.48
97:	2	NE	10	7	5.10	5.20	5.33	1.02	1.17
98:	3	SW	10	0	3.15	2.90	1.74	1.00	-1:00
99:	4	SE	10	0	1.16	1.00	1.00	1.00	-1:00
100:	9	UDEST.		9	1.576	1.894	0.00	1.00	
101:	STOP:	SE	STATION:	BIR B	270380	070680			
102:	1	NW	10	13	1.68	2.31	1.20	1.50	0.89
103:	2	NE	10	0	1.10	2.24	0.00	1.14	0.267
104:	3	SW	10	0	3.45	3.00	0.00	1.40	-1:00
105:	4	SE	10	0	2.86	4.50	0.00	1.72	-1:00
106:	9	UDEST.		9	1.80	2.50	0.00	1.20	
107:	STOP:	BR	STATION:	BIR B	270380	070680			
108:	1	NW	10	10	3.74	4.60	2.70	4.95	7.05
109:	2	NE	10	10	4.76	3.51	4.00	4.50	7.70
110:	3	SW	10	9	6.80	3.58	6.00	10.50	-1:00
111:	4	SE	10	9	4.85	4.91	3.00	4.00	-1:00
112:	9	UDEST.		9	3.67	1.41	3.00	4.16	
113:	STOP:	SR	STATION:	BIR D	270380	070680			
114:	1	NW	10	12	1.69	1.73	1.45	3.15	4.35
115:	2	NE	10	11	2.84	2.40	1.40	3.40	5.90
116:	3	SW	10	0	0.810	0.637	1.00	1.40	-1:00

*** PIX*NIP(1) 5-SVA/A(1) ***

01	63:	4 SW	7	6	1.74	1.04	1.57	2.39	-1.00
	64:	9 UDEST.	3	1	.543	.941	.000	-1.00	
01	65:	STOP:							
	66:	MW STATION:	RVK A	25	130280	170480	2.31	3.21	4.61
01	67:	1 SW	25	2	2.60	1.45	4.05	-1.00	
01	68:	2 SE	25	2	4.90	1.45	4.54	-9.33	
01	69:	3 SE	24	2	4.38	2.44	8.57	-1.00	
	70:	4 SW	27	3	9.20	2.49	5.13	-1.00	
	71:	9 UDEST.	3	3	4.21		-1.00		
01	72:	STOP:							
	73:	FE STATION:	RVK A	22	130280	170480	57.7	94.6	163
01	74:	1 SW	22	1	75.1	57.7	21.0	-1.00	
01	75:	2 SE	25	2	191.	67.5	1.90	-1.00	
01	76:	3 SE	24	2	154.	80.0	376.	-1.00	
	77:	4 SW	27	3	335.	240.	550.	-1.00	
	78:	9 UDEST.	3	3	110.	73.5	-1.00		
01	79:	STOP:							
	80:	NI STATION:	RVK A	20	160280	170480	1.06	1.31	1.74
01	81:	1 SW	20	1	994	537	1.51	-1.00	
01	82:	2 SE	24	2	1.40	.267	1.00	-2.21	
01	83:	3 SE	24	2	1.12	.360	1.80	-1.00	
01	84:	4 SW	27	3	1.83	.840	1.00	-1.00	
	85:	9 UDEST.	3	3	1.35	.853	-1.00		
01	86:	STOP:							
	87:	CU STATION:	RVK A	25	130280	170480	955	1.51	3.38
01	88:	1 SW	25	2	1.25	937	2.95	-1.00	
01	89:	2 SE	25	2	2.31	1.10	1.00	-1.00	
01	90:	3 SE	24	2	3.37	800	4.70	-2.80	
01	91:	4 SW	27	3	1.64	2.00	1.00	-1.00	
	92:	9 UDEST.	3	3	1.81	1.61	-1.00		
01	93:	STOP:							
	94:	ZI STATION:	RVK A	25	160280	170480	10.4	12.0	23.8
01	95:	1 SW	25	2	11.0	7.40	41.7	-1.00	
01	96:	2 SE	25	2	40.7	23.8	13.7	-1.00	
01	97:	3 SE	24	2	15.7	11.9	30.0	-1.00	
01	98:	4 SW	27	3	44.4	29.0	15.0	-1.00	
	99:	9 UDEST.	3	3	20.2	13.0	-1.00		
01	100:	STOP:							
	101:	AS STATION:	RVK A	7	160280	170480	6.00	3.01	1.30
01	102:	1 SW	25	2	240	457	1.00	-1.00	
01	103:	2 SE	25	2	7.14	5.35	1.00	-1.00	
01	104:	3 SE	24	1	1.14	890	1.00	-1.00	
01	105:	4 SW	19	1	3.15	2.74	2.00	-1.00	
	106:	9 UDEST.	3	1	.250	.431	.000	-1.00	
01	107:	STOP:							
	108:	SE STATION:	RVK A	5	130280	170480	.000	.000	.220
01	109:	1 SW	25	2	325.01	706.01	.000	-1.00	
01	110:	2 SE	25	2	.000	.000	.000	-1.00	
01	111:	3 SE	24	1	.902.01	1.03	.000	-1.00	
01	112:	4 SW	17	1	.254	1.21	.000	-1.00	
	113:	9 UDEST.	3	1	.377.01	.632.01	.000	-1.00	
01	114:	STOP:							
	115:	BR STATION:	RVK A	10	100280	170480	2.01	3.17	4.50
01	116:	1 SW	25	2	2.05	2.61	.000	-1.00	
01	117:	2 SE	25	2	.000	.000	.000	-1.00	
01	118:	3 SE	24	1	.410	1.11	.000	-1.00	
01	119:	4 SW	10	1	.431	1.14	.000	-1.00	
	120:	9 UDEST.	3	1	2.10	2.34	1.00	-1.00	
01	121:	STOP:							
	122:	SR STATION:	RVK A	25	160280	170480	1.33	1.41	2.50
01	123:	1 SW	25	2	1.29	1.71	1.00	-1.00	
01	124:	2 SE	25	2	1.67	.700	1.00	-1.00	
01	125:	3 SE	24	2	1.45	.885	1.00	-1.00	

83 JAN 20-13:00:29 16-00003 DATE 033083

*** PIX*MMR(1) 5-SVA/A(1) ***

b1	126:	4 SW	7	3	3:62	2:79	4:39	6:67	-1:00
	127:	9 UDEST.			1:50	1:03	2:02	-1:00	
w1	128:	STOF:	RVK A	180280	170480				
	129:	1 NW	23	9	.94	.126	.000	.199	.302
	130:	2 NE	24	1	.133	.231	.000	-1:00	.374
	131:	3 SE	24	11	.120	.149	.000	.532	-1:00
	132:	4 SW	27	5	.349	.306	.191	-1:00	
	133:	9 UDEST.		2	.129	.112			
	134:								
w1	135:	STOF:	RVK A	130280	170480				
	136:	1 NW	22	0	.000	.000	.000	.020	.300
	137:	2 NE	23	0	.525	.466	.682	-1:00	.000
	138:	3 SE	24	0	.643	.254	.000	-1:00	.000
	139:	4 SW	27	0	.504	.869	.000	-1:00	.000
	140:	9 UDEST.		2	.583	.561	.628	-1:00	.000
	141:								
	142:								
w1	143:	STOF:	RVK A	130280	170480				
	144:	1 NW	22	1	.224	.520	.000	.020	1:10
	145:	2 NE	23	1	2.395	1.650	.000	-1:00	.000
	146:	3 SE	24	0	1.668	1.333	.000	-1:00	.000
	147:	4 SW	27	0	.331	.671	.000	-1:00	.000
	148:	9 UDEST.		1			.000	.020	1:10
	149:						.000	-1:00	.000
	150:						.000	-1:00	.000
w1	151:	STOF:	RVK A	130280	170480				
	152:	1 NW	22	1	.101	.329	.000	.020	1:04
	153:	2 NE	23	1	.547	.947	.000	-1:00	.000
	154:	3 SE	24	1	.421	1.311	.000	-1:00	.000
	155:	4 SW	27	1	.690	1.675	.000	-1:00	.000
	156:	9 UDEST.		1	.390		.000	-1:00	.000
	157:						.000	.020	6:17
w1	158:	STOF:	RVK A	130280	170480				
	159:	1 NW	22	5	1.34	2.550	.000	-1:00	.000
	160:	2 NE	23	1	1.18	2.730	.000	-1:00	.000
	161:	3 SE	24	0	1.97	7.360	.000	-1:00	.000
	162:	4 SW	27	0	1.28	5.69	.000	-1:00	.000
	163:	9 UDEST.		1			.000	.020	6:17
	164:						.000	-1:00	.000
w1	165:	STOF:	RVK A	180280	170480				
	166:	1 NW	22	2	10.3	7.40	9.13	14.4	24.3
	167:	2 NE	23	0	20.4	11.3	18.7	-1:00	.000
	168:	3 SE	24	0	18.0	12.1	13.2	-1:00	.000
	169:	4 SW	27	0	11.2	2.80	9.9	-1:00	.000
	170:	9 UDEST.		3					

STOF:	AL STATION:	RVK D	180280	170480	13.7	19.2	31.4
1	NW	25	14.1	10.4	19.2	31.4	31.4
2	NE	27	31.0	18.0	13.0	31.0	31.0
3	SE	27	17.5	16.5	13.4	31.2	31.2
4	SW	27	30.4	16.5	52.8	31.0	31.0
9	UBEST.	3	6.97	12.1	-1.00	31.0	31.0
10	SI STATION:	RVK D	100280	170480	204	317	392
11	NW	21	246	295	120	317	392
12	NE	23	283	90	120	317	392
13	SE	27	165	86	120	317	392
14	SW	27	440	301	657	317	392
9	UBEST.	3	188	31.0	-1.00	317	392
16	S STATION:	RVK D	180280	170480	151+04	196+04	343+04
17	NW	22	147	122	173+04	196+04	343+04
18	NE	22	290	340	120	196	343
19	SE	24	300	589	331+04	445+04	445+04
20	SW	27	434	326	320+04	445+04	445+04
9	UBEST.	3	211	814	187+04	1.00	1.00
23	CHW STATION:	RVK D	180280	170480	120	265	412
24	NW	22	185	137	120	265	412
25	NE	22	43.0	5.95	120	265	412
26	SE	24	87.0	53.5	120	265	412
27	SW	27	163	87.5	120	265	412
9	UBEST.	3	191	187	-1.00	265	412
30	K STATION:	RVK D	130280	170480	30.7	70.1	135
31	NW	22	63.8	78.9	30.7	70.1	135
32	NE	22	104	25.7	30.7	70.1	135
33	SE	24	198	26.0	120	135	135
34	SW	27	132	86.1	120	135	135
9	UBEST.	3	70.6	43.9	-1.00	135	135
37	CA STATION:	RVK D	180280	170480	18.0	19.6	27.5
38	NW	22	18.0	9.21	18.0	19.6	27.5
39	NE	22	45.9	15.5	18.0	19.6	27.5
40	SE	24	31.0	15.5	18.0	19.6	27.5
41	SW	27	50.2	44.9	18.0	19.6	27.5
9	UBEST.	3	19.1	2.78	-1.00	19.6	27.5
44	TI STATION:	RVK D	180280	170480	0.00	1.44	3.17
45	NW	22	800	1.20	0.00	1.44	3.17
46	NE	22	5.50	2.40	0.00	1.44	3.17
47	SE	24	2.50	1.97	0.00	1.44	3.17
48	SW	27	6.23	5.64	0.00	1.44	3.17
9	UBEST.	3	1.757	1.20	-1.00	1.44	3.17
52	V STATION:	RVK D	180280	170480	4.95	6.35	11.7
53	NW	22	5.53	3.35	4.95	6.35	11.7
54	NE	22	6.41	1.33	4.95	6.35	11.7
55	SE	24	7.70	2.77	4.95	6.35	11.7
56	SW	27	6.99	3.84	4.95	6.35	11.7
9	UBEST.	3	5.53	1.00	-1.00	6.35	11.7
58	CR STATION:	RVK D	180280	170480	3.00	1.00	1.38
59	NW	22	130	440	3.00	1.00	1.38
60	NE	22	311	983	3.00	1.00	1.38
61	SE	24	347	575	3.00	1.00	1.38

83 JAN 20-13:03:02 17-00002 DATE 033083

PIX*NHP(1) 5-SV8/A(1) ***

63:	4	SW	1.632	1.000	
64:	9	UBEST.	.567		
65:					
66:	STOF:	MW STATION:	RVK B	100280	170480
67:	1	NW	1.37	1.30	
68:	2	NE	5.11	1.43	
69:	3	SE	5.10	2.13	
70:	4	SW	8.13	5.00	
71:	9	UBEST.	4.72	1.72	
72:					
73:	STOF:	FE STATION:	RVK B	180280	170480
74:	1	NW	24.5	17.0	
75:	2	NE	158.5	57.0	
76:	3	SE	99.5	39.5	
77:	4	SW	132.5	92.4	
78:	9	UBEST.	41.5	29.4	
79:					
80:	STOF:	NI STATION:	RVK B	100280	170480
81:	1	NW	2.30	.31	
82:	2	NE	4.46	1.34	
83:	3	SE	3.37	1.13	
84:	4	SW	3.80	1.09	
85:	9	UBEST.	2.14	.191	
86:					
87:	STOF:	CU STATION:	RVK B	180280	170480
88:	1	NW	9.45	1.00	
89:	2	NE	5.98	3.60	
90:	3	SE	2.55	3.80	
91:	4	SW	4.09	2.50	
92:	9	UBEST.	1.69	1.00	
93:					
94:	STOF:	ZI STATION:	RVK B	180280	170480
95:	1	NW	25.7	32.0	
96:	2	NE	82.3	42.1	
97:	3	SE	42.8	20.8	
98:	4	SW	83.2	51.8	
99:	9	UBEST.	32.2	28.0	
100:					
101:	STOF:	AS STATION:	RVK B	100280	170480
102:	1	NW	88.4	2.23	
103:	2	NE	16.8	1.09	
104:	3	SE	2.70	1.70	
105:	4	SW	5.70	4.70	
106:	9	UBEST.	2.19	2.30	
107:					
108:	STOF:	SE STATION:	RVK B	100280	170480
109:	1	NW	118	200	
110:	2	NE	000	000	
111:	3	SE	800	181	
112:	4	SW	772	554	
113:	9	UBEST.	238	210	
114:					
115:	STOF:	BR STATION:	RVK B	180280	170480
116:	1	NW	7.21	6.10	
117:	2	NE	12.9	5.24	
118:	3	SE	8.84	3.03	
119:	4	SW	15.3	7.60	
120:	9	UBEST.	9.00	4.19	
121:					
122:	STOF:	SR STATION:	RVK B	180280	170480
123:	1	NW	55.4	1.10	
124:	2	NE	9.19	2.44	
125:	3	SE	56.4	3.21	
126:					
127:					
128:					
129:					
130:					
131:					
132:					
133:					
134:					
135:					
136:					
137:					
138:					
139:					
140:					
141:					
142:					
143:					
144:					
145:					
146:					
147:					
148:					
149:					
150:					
151:					
152:					
153:					
154:					
155:					
156:					
157:					
158:					
159:					
160:					
161:					
162:					
163:					
164:					
165:					
166:					
167:					
168:					
169:					
170:					
171:					
172:					
173:					
174:					
175:					
176:					
177:					
178:					
179:					
180:					
181:					
182:					
183:					
184:					
185:					
186:					
187:					
188:					
189:					
190:					
191:					
192:					
193:					
194:					
195:					
196:					
197:					
198:					
199:					
200:					

83 JAN 20-13:03:02 17-00004 DATE 033203

*** PIX*HMP(1) 5-SVM/A(1) ***

01	189:	4 SW	725:	369:	603:	-1.10	-1.00
	190:	9 UDEST.	706:	507:	799:	-1.00	-1.00
	191:						
01	192:	STOF: 1 SW	100280	170480	139+04	268+04	524+04
01	193:	2 NE	210+04	248+04	439+04	120	100
01	194:	3 SE	471+04	073	593+04	832+04	111+05
01	195:	4 SW	643+04	272+04	810+04	144+05	100
	196:	9 UDEST.	917+04	510+04	459+04	120	100
	197:		300+04	130+04			
	198:						
01	199:	STOF: 1 SW	130280	170480	500	670	115
01	200:	2 NE	530	305	121	100	100
01	201:	3 SE	1200	300	900	140	100
01	202:	4 SW	920	900	900	100	100
	203:	9 UDEST.	1200	900	900	100	100
	204:		1700	900	900	100	100

63:	4	SW	10	7	509	702
64:	9	UBEST.			591	430
65:						
66:	STOF:	NI	STATION:	SF7 A	140380	090580
67:	1	NW		9	2:31	6:30
68:	2	NE		10	7:07	1:08
69:	3	SE		10	6:07	3:37
70:	4	SW		10	5:12	3:37
71:	9	UBEST.		10	5:48	3:51
72:						
73:	STOF:	FE	STATION:	SF7 A	140380	090580
74:	1	NW		9	1:17	3:09
75:	2	NE		10	1:18	3:09
76:	3	SE		10	3:39	3:09
77:	4	SW		10	2:46	1:90
78:	9	UBEST.		10	3:62	1:78
79:						
80:	STOF:	NI	STATION:	SF7 A	140380	090580
81:	1	NW		7	7:45	4:73
82:	2	NE		9	1:87	1:50
83:	3	SE		10	1:34	1:50
84:	4	SW		10	1:07	1:21
85:	9	UBEST.		10	1:02	1:21
86:						
87:	STOF:	CU	STATION:	SF7 A	140380	090580
88:	1	NW		9	5:00	2:40
89:	2	NE		10	1:30	1:03
90:	3	SE		10	1:34	1:21
91:	4	SW		10	1:04	1:51
92:	9	UBEST.		10	1:34	4:73
93:						
94:	STOF:	Z	STATION:	SF7 A	140380	090580
95:	1	NW		9	4:57	2:08
96:	2	NE		10	18:4	4:14
97:	3	SE		10	12:5	7:14
98:	4	SW		10	10:0	4:20
99:	9	UBEST.		10	19:0	29:9
100:						
101:	STOF:	AS	STATION:	SF7 A	140380	090580
102:	1	NW		7	1:00	2:03
103:	2	NE		3	1:20	1:53
104:	3	SE		3	6:31	8:01
105:	4	SW		5	8:39	8:01
106:	9	UBEST.		10	5:59	6:70
107:						
108:	STOF:	SE	STATION:	SF7 A	140380	090580
109:	1	NW		1	7:51	2:26-J1
110:	2	NE		1	9:22	3:33-J1
111:	3	SE		2	12:61	3:81-J1
112:	4	SW		4	5:16-J1	6:14-J1
113:	9	UBEST.		1	2:00-J1	9:04-J1
114:						
115:	STOF:	BR	STATION:	SF7 A	140380	090580
116:	1	NW		9	2:33	1:81
117:	2	NE		10	1:71	1:74
118:	3	SE		10	2:50	4:04
119:	4	SW		9	2:21	5:51
120:	9	UBEST.		10	2:50	5:51
121:						
122:	STOF:	RB	STATION:	SF7 A	140380	090580
123:	1	NW		0	5:50	3:66
124:	2	NE		10	2:09	1:63
125:	3	SE		16	1:76	1:83

*** PIX*NHP (1) 5-SFB/A(U) ***

126:	4 SW	9	845	462
127:	9 UDEST.	10	912	472
128:				
129:	STOF: SR STATION:	SF7 B	140380 090580	
130:	1 NW	9	329	151
131:	2 NE	10	926	510
132:	3 SE	16	725	723
133:	4 SW	9	679	663
134:	9 UDEST.	10	868	683
135:				
136:	STOF: NO STATION:	SF7 B	140380 090580	
137:	1 NW	9	127	201
138:	2 NE	10	349	391
139:	3 SE	16	259	256
140:	4 SW	9	262	219
141:	9 UDEST.	10	207	239
142:				
143:	STOF: SH STATION:	SF7 B	140380 090580	
144:	1 NW	9	192	500
145:	2 NE	10	136	130
146:	3 SE	16	1471	1847
147:	4 SW	9	530	119
148:	9 UDEST.	10	554	1695
149:				
150:	STOF: BA STATION:	SF7 B	140380 090580	
151:	1 NW	9	000	000
152:	2 NE	10	129	317
153:	3 SE	16	193	417
154:	4 SW	9	000	000
155:	9 UDEST.	10	217	355
156:				
157:	STOF: PB STATION:	SF7 B	140380 090580	
158:	1 NW	9	334	779
159:	2 NE	10	300	220
160:	3 SE	16	261	167
161:	4 SW	9	242	107
162:	9 UDEST.	10	252	123
163:				
164:	STOF: SA STATION:	SF7 B	140380 090580	
165:	1 NW	9	561	39
166:	2 NE	10	111+04	795
167:	3 SE	16	167+04	682
168:	4 SW	9	187+04	117+04
169:	9 UDEST.	10	216+04	748
170:				
171:	STOF: N3 STATION:	SF7 B	140380 090580	
172:	1 NW	9	143	451
173:	2 NE	10	129	782
174:	3 SE	16	232	153
175:	4 SW	9	299	259
176:	9 UDEST.	10	225	165
177:				
178:	STOF: M5 STATION:	SF7 B	140380 090580	
179:	1 NW	9	370	77
180:	2 NE	10	428	145
181:	3 SE	16	453	155
182:	4 SW	9	390	601
183:	9 UDEST.	10	525	113
184:				
185:	STOF: G2 STATION:	SF7 B	140380 090580	
186:	1 NW	9	113	353
187:	2 NE	10	144	483
188:	3 SE	16	165	101
189:				
190:				
191:				
192:				
193:				
194:				
195:				
196:				
197:				
198:				
199:				
200:				
201:				
202:				
203:				
204:				
205:				
206:				
207:				
208:				
209:				
210:				
211:				
212:				
213:				
214:				
215:				
216:				
217:				
218:				
219:				
220:				
221:				
222:				
223:				
224:				
225:				
226:				
227:				
228:				
229:				
230:				
231:				
232:				
233:				
234:				
235:				
236:				
237:				
238:				
239:				
240:				
241:				
242:				
243:				
244:				
245:				
246:				
247:				
248:				
249:				
250:				
251:				
252:				
253:				
254:				
255:				
256:				
257:				
258:				
259:				
260:				
261:				
262:				
263:				
264:				
265:				
266:				
267:				
268:				
269:				
270:				
271:				
272:				
273:				
274:				
275:				
276:				
277:				
278:				
279:				
280:				
281:				
282:				
283:				
284:				
285:				
286:				
287:				
288:				
289:				
290:				
291:				
292:				
293:				
294:				
295:				
296:				
297:				
298:				
299:				
300:				

83 JAN 20-13:18:46 2U-00J04 DATE 033083

*** PIX*NMR(1) 5-SFB/A(0) ***

189:	4 SW	9	156:	03.7
190:	9 UDEST.	10	157:	144.
191:				
192:	STOF:	SX STATION:	SF7 B	140380 090580
193:	1 NW	9	158:	110+04 177
194:	2 NE	10	159:	200+04 180+04
195:	3 SE	10	160:	300+04 192+04
196:	4 SW	10	161:	520+04 371+04
197:	9 UDEST.	10	162:	410+04 212+04
198:				
199:	STOF:	S2 STATION:	SF7 B	140380 090580
200:	1 NW	9	163:	4.89 2.03
201:	2 NE	10	164:	6.15 4.90
202:	3 SE	10	165:	5.19 4.70
203:	4 SW	10	166:	9.22 4.18
204:	9 UDEST.	10	167:	7.10 4.75
169:	100+04		182:	150+04-1.00
198:	300+04		186:	470+04 380+04
	500+04		187:	780+04-1.00
	700+04		188:	400+04-1.00
	900+04		189:	5.00
			190:	7.00
			191:	4.00
			192:	4.00
			193:	6.00
			194:	8.00
			195:	1.00
			196:	1.00
			197:	1.00
			198:	1.00
			199:	1.00
			200:	1.00
			201:	1.00
			202:	1.00
			203:	1.00
			204:	1.00

