

ASSESSMENT OF THE WATER SOLUBLE IONIC SPECIES OF SUSPENDED PARTICULATE MATTER, COLLECTED AT A COASTAL SPOT, DE HAAN, BELGIUM

Horemans Benjamin¹, László Bencs^{1,2}, Agnieszka Krata¹, Anna Buczynska¹, Alin Dirtu¹, Katleen Van Meel¹ and René Van Grieken¹

¹ University of Antwerp (Campus Drie Eiken), Department of Chemistry, Micro and Trace Analysis Centre (MiTAC), Environmental Analysis Group, Universiteitsplein 1, B-2610 Antwerp, Belgium
E-mail: Benjamin.Horemans@ua.ac.be

² Hungarian Academy of Sciences, Research Institute for Solid State Physics and Optics, H-1525, PO Box 49 Budapest, Hungary

Chemical characterisation of suspended particulate matter (SPM) is very useful for broadening the knowledge concerning processes which are active in the atmosphere (e.g. Lin, 2002). Continental air-masses were found to contain high levels of anthropogenic emitted species, while these levels decreased when the influence changed to an oceanic atmosphere. The high levels of NH_4^+ , NO_3^- and non-sea-salt (NSS) SO_4^{2-} in the fine SPM fraction of continental air-masses (0.38 , $0.15\mu\text{g.N.m}^{-3}$ and $0.59\mu\text{g.m}^{-3}$, respectively) stresses the importance of secondary aerosol formation as a source for SPM. The dominant appearances of Na^+ , Cl^- , Mg^{2+} and Ca^{2+} in coarse maritime air masses show the presence of sea-salts and soil dust in the atmosphere at the coastal region. Neutralisation ratios higher than unity (1.20 - 1.59) for the fine SPM fraction suggested an excess of NH_4^+ , which was most probably present in the form of NH_4Cl due neutralisation of HCl . The latter was formed in atmospheric reactions with sea-salt particles (Kadowaki, 1977), during which HCl escapes (0.13 and 0.58% lost sea-salt chloride for winter and summer, respectively). Correlation analysis showed that warm and dry summer conditions eliminated some influence of sea-salts on atmospheric processes, that where found to be active during winter. NSS SO_4^{2-} was the dominant S-contributor in the fine fraction (83%). During winter, a total SOR value of 0.61 was reached, while summer gave a significant lower value (0.24). These values classified the sampling-site at the Belgian coast as a combined receptor-source area, accepting pollution from the continent and its local surroundings (Shaw and Rodhe, 1982).

References

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