

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

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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 were 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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