



## **Organic nitrogen in the atmosphere – what is it, and where does it come from?**

**J.N. Cape** (1), J. Gonzalez (1,2) and M.R. Heal (2)

(1) Centre for Ecology and Hydrology, Edinburgh, UK, (2) School of Chemistry, University of Edinburgh, UK (jnc@ceh.ac.uk / Fax: +44 131 445 3943 / Phone: +44 131 445 8533)

Organic nitrogen compounds are overlooked components of the transfer of nitrogen from the atmosphere to the earth's surface. Recent reviews have indicated that the contribution of water-soluble organic nitrogen (WSON) in precipitation to wet deposition may be up to one-third of the total, yet little is known about the chemical composition, form or sources of this material. Initial scepticism about the nature of WSON has to some extent been dispelled, but the broad range of possible composition and emission sources means that the transfer pathways are still somewhat uncertain. It is known, for example, that biological processes interconvert inorganic and organic nitrogen in forest canopies, but it is not clear how much biological activity may occur in the atmosphere or on the surfaces of sampling equipment. The presence of both gaseous and particulate WSON in the atmosphere implies that dry deposition is an important but unquantified pathway for transfer of organic nitrogen to the earth's surface.

We report here some initial measurements of WSON in the gas and particle phases, and a long-term study of the contribution of dry-deposited material to the WSON content of bulk precipitation. This study used novel 'flushing' rain collectors that separate material dry-deposited on the collector funnels prior to rainfall from the material dissolved in rain. The results indicate that dry deposition to collector surfaces may account for some, but not all, of the WSON in precipitation sampled using bulk collectors. However, the questions remain as to the nature and sources of this material, and its role in the overall atmospheric deposition of nitrogen to sensitive ecosystems.