THE UNAMBIGUOUS RECOVERING OF AMMONIA IN AIR SAMPLES

D. Bicanic, H. Sauren, C. van Asselt

► To cite this version:

D. Bicanic, H. Sauren, C. van Asselt. THE UNAMBIGUOUS RECOVERING OF AMMONIA IN AIR SAMPLES. Journal de Physique IV Proceedings, 1991, 01 (C7), pp.C7-704-C7-704. 10.1051/jp4:19917189 . jpa-00250868

HAL Id: jpa-00250868

<https://hal.science/jpa-00250868>

Submitted on 1 Jan 1991

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

THE UNAMBIGUOUS RECOVERING OF AMMONIA IN AIR SAMPLES

D. BICANIC, H. SAUREN and C. van ASSELT

*Wageningen Agricultural University, Department of Agricultural Engineering and Physics,
Duivendaal 1, NL-6701 AP Wageningen, The Netherlands*

Despite the substantial development and the variety of methods that have emerged in the past decade, the measurement technologies for precise determination of ammonia in the atmospheric air still have their short comings. This is in particular true when rapid measurement of the low ammonia concentrations in the ambient air are being concerned.

For spectroscopic methods the operating principle of which is based on the existence of spectral coincidence between the characteristic absorption frequency of the specimen and the emission frequency of the source, the effect of interferences due to other absorbing constituents commonly impedes the specificity. Throughout the past few years carbondioxide laser photoacoustic system has been developed to monitor ammonia in the near ppbv range. To achieve the full potential of this powerful technique for ammonia monitoring it was necessary to construct the measuring cell that allows the application of an external electric field (Stark effect) in order to discriminate between the water, carbondioxide and ammonia absorption. Further enhancement of the specificity was obtained by using intermodulation detection scheme that implies signal observation at the frequency sidebands of the modulating fields. This new methodology, capable of rapidly detecting ammonia (sensitivity 2 ppbv) in realistic air is sample is shown immune to potential interferences with exception of samples characterized by the high relative humidity. The decrease in the signal magnitude observed at high humidity level is presumably caused by the occurrence of chemical reactions causing the reduction of the gaseous ammonia.