

A DOAS System for Monitoring of Ammonia Emission in the Agricultural Sector

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Abstract: Ammonia emission in the atmosphere is a major concern in EU countries. In 2005 it was reported by European Environmental Agency (EEA) that 93% of the EU15 countries come from agricultural sector. This paper reported an open-path differential optical absorption spectroscopy (DOAS) system to monitor ammonia emission in the agricultural sector. In the initial stage, analysis of the absorption lines for ammonia in the ultraviolet region was performed and the optimum wavelength for ammonia measurement was selected at 212 nm. A few tests were conducted to verify the detection system reliability and this DOAS system was able to detect various ammonia concentrations from 0 to 100 ppm. It is also shown that this DOAS system has better response and recovery time than a chemisorption sensor. In this paper, ammonia levels measurement in a cattle barn for initial monitoring purpose is also reported. The DOAS system is able to measure ammonia concentrations of 2 ppm with fast response time (4 s).

Keywords: Ammonia sensing, Environmental monitoring, Gas detection, Spectroscopy

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