This study was conducted for a chemical plant that produces NH_3 and a wide range of fertilizers including urea, ammonium phosphate and nitrate etc. In order to assess the NH_3 transport and diffusion into the atmosphere we used a plume dispersion model named Aermod, hourly validated meteorological data for 2014, stack emission data and a surface emission factor that was calculated using inverse modeling.

Results indicate that taking in consideration only the stack emissions, the maximum concentrations are 6 times smaller than the limit. The situation changes dramatically when we introduces an emission factor for diffuse emissions, and values above limit can be often seen, especially in the nearby of the facility. The study revealed that in case of an accident when we took in consideration a 5 times bigger emission data and adverse weather conditions, the population who live in an area of 2 km can be exposed to very high concentrations of NH_3. Also, the results indicated the most adverse weather conditions for dispersion and areas where the pollutant tends to cumulate and should be evacuated fast in an extreme situation.

Keywords: *air pollution, plume, dispersion, fertilizer;*

III-P-9. SPATIAL DISTRIBUTION AND TEMPORAL VARIATION OF CONCENTRATIONS OF HEAVY METALS IN SOIL AND GROUNDWATER IN THE AREA WITH METALLIFEROUS MINERALS PROCESSING ACTIVITIES

Simona Calinescu, Lidia Kim, Gheorghe Batrinesc, Bogdan Stanescu, Ramona Dumitrache

ABSTRACT

Anthropogenic activities such as mining and mineral processing have introduced a variety and a large amount of heavy metals in the ecosystem. Heavy metals are the most toxic pollutants, with impact the environment and human health. This study shows the spatial distribution and temporal variation of concentrations of heavy metals in soil and groundwater in the active processing of metal ores. The area under investigation is located in northern Romania, Maramures County and includes two tailings ponds and

adjacent zones. The paper includes the results corresponding to two sampling campaigns. We determined the concentrations of heavy metals (As, Cd, Cu, Pb, Zn, Mn, Ni) by mass spectrometry with inductively coupled plasma (ICP-MS) in 19 groundwater samples and 40 soil samples. The results were analyzed to address critical goal.

Keywords: *heavy metals, groundwater, soil, pollution*

III-P-10. IMPROVED AQUA REGIA METAL EXTRACTION USING A LOAM SOIL CRM ERC-CC141 AND A PERFORMANT MICROWAVE OVEN

Nicoleta Mirela Marin[1,2], Gabriela Geanina Vasile[1], Jana Petre[1], Liliana Valeria Cruceru[1]

[1] *National Research and Development Institute for Industrial Ecology – Bucharest, 71-73 Podul Dambovitei Street, 060650, Bucharest, Romania* *e-mail:* nicoleta.marin@incdecoind.ro

[2] *Department of Analytical Chemistry, Faculty of Chemistry, University of Bucharest, 2-14 Blvd. Regina Elisabeta, 030018, Bucharest, Romania,*

Abstract

In this study a digestion method for determination of metals (Co, Cr, Cu, Ni, Pb, Zn) in soil aqua regia extracts was performed using a microwave digestion technique combined with ICP-EOS and FAAS techniques. Improved digestion program was applied in three steps at 220ºC maximum temperature for 35 minutes to 1 g of soil with a mixture of HCl and HNO_3 (report 6 mL to 2 mL). In experimental studies, a Certified Reference Material CRM ERC-CC141 loam soil was used. The recovery percentages in CRM standard were situated for all metals in the range 93.5% to 105% for ICP-EOS determinations and 92% to 107% for FAAS determinations.

Keywords: *soil, metals, microwave digestion methods, ICP-EOS, FAAS*