

**COM10. HIGH LOAD AMONIA WASTEWATER TREATMENT USED TO
RECOVER USEFUL BY PRODUCTS**

Mihaela Alexie¹, Laurentiu Razvan Dinu¹, Cristiana Cosma¹, Viorel Ion Patroescu¹, Ionut Cristea¹

¹National Research and Development Institute for Industrial Ecology ECOIND, Str. Drumul Podu Dambovitei 71-73, 060652, Bucharest, Romania, tehnologi@incdecoind.ro

Abstract

Struvite precipitation is a viable alternative for the treatment of the ammonium rich leachate and waste water with ammonium concentration C_{NH_4} up to 2 g/L. Struvite (magnesium ammonium phosphate) can be used in agriculture as a N-P fertilizer. Among the main advantages of struvite which sustain its agricultural use, low level of heavy metals, high content of active components, slow release of useful elements in soil as consequence of product solubility and slow dissociation kinetic must be mentioned.

Experimental research for the ammonium ion removal with struvite precipitation using synthetic solutions ($C_{NH_4} = 1 \div 3$ g/L) and real wastewater samples ($C_{NH_4} = 1$ g/L) and various magnesium and phosphate sources were aimed to assess the influence of molar ratio, reaction time and mixing system.

Observations were also made regarding the struvite crystal growth with a target of the mean size higher than 100 μ m. For specific working conditions (e.g. pH = 9, 30 min. reaction time Mg: N: P = 1: 1: 0,8 molar ratio) struvite crystals with $D_{90} = 139$ μ m were obtained. The preferred technological option is undersaturation with respect to phosphate and with crystal seed recycle.

Keywords: *ammonium recovery, fertilizer, precipitation, struvite*