Environmental Engineering and Management Journal, October 2006, Vol.5, No.4, 581-589
http://omicron.ch.tuiasi.ro/EEMJ/

"Gh. Asachi" Technical University of Iasi, Romania

IMPROVED Fe-BASED PRE-HYDROLYZED COAGULANTS

Ingrid Buciscanu*, Melinda Pruneanu, Vasilica Maier, Stelian Maier

"Gh.Asachi" Technical University of Iaşi, Department of Leather Chemical Technology, O.P. Iasi 10, CP 2070 Iasi, 700050, Romania

Abstract

This paper investigates the conditions in which stable ferric basic solutions, used as coagulants in primary treatments of waters and wastewaters, can be prepared starting from copperas ($FeSO_4$ $7H_2O$). A series of partially hydrolyzed ferric solutions were obtained, using exclusively hydrogen peroxid H_2O_2 as oxidation/basification agent, in a molar ratio $FeSO_4/H_2O_2$=1:1 and different $FeSO_4/H_2SO_4$ molar ratios, from 20:1 to 2:1; temperature was varied from 50ºC to 70ºC. Simultaneous oxidation and basification lead to partially hydrolyzed Fe(III) solutions, in which the basification degree and stability are controlled by the $FeSO_4/H_2SO_4$ ratio; molar ratios $FeSO_4/H_2SO_4$ between 2.03:1 and 5:1 result in stable basic solutions. Metal-polysilicate coagulants were obtained through a modified copolymerization procedure involving the *in-situ* generation of silicic acid (**SA**) at a Si/Fe molar ratio of 1:10, followed by oxidation-basification. All the solutions were characterized in terms of total iron concentration, basicity degree, residual Fe(II), density and stability.

Keywords: prehydrolized polyferric sulphate, coagulant, metal-polysilicate, turbidity

* Author to whom all correspondence should be addressed: Phone/Fax: +40232 278950, e-mail: iiacomi@ch.tuiasi.ro