Desalination and Water Treatment
www.deswater.com
33 (2011) 140–146
September
1944-3994 / 1944-3986
doi: 10.5004/dwt.2011.2622

Advances in coagulation/flocculation field: Al- and Fe-based composite coagulation reagents

P.A. Moussas, N.D. Tzoupanos, A.I. Zouboulis*

Division of Chemical Technology, Department of Chemistry, Aristotle University of Thessaloniki,GR-54124 Thessaloniki, Greece
Tel. +30 24210 74480; Fax +30 24210 74380; email: zoubouli@chem.auth.gr

Received 20 January 2010; Accepted in revised form 1 October 2010

ABSTRACT

Currently, the research in the field of coagulation/flocculation process is focused on the synthesis of new composite coagulants, which are constituted of both inorganic and organic materials, so as to utilize within one reagent the advantages of both inorganic and organic components. Among possible organic additives, an anionic polymer can be used by introducing it into a pre-polymerised metal (i.e. Al or Fe) coagulant. In this study, a co-polymer of acrylamide and sodium acrylate is combined with two widely used Al or Fe based coagulants, i.e. polyaluminium chloride (PACl), and polyferric sulphate (PFS), thus producing novel composite coagulation reagents. The coagulants were characterised in terms of typical physico-chemical properties, such as the degree of polymerisation, pH, conductivity, turbidity. Finally, coagulation experiments (jar-tests) enable the comparable assessment/evaluation of coagulants efficiency, when treating model kaolin-humic acid suspensions or pre-treated tannery wastewater.

Keywords: Coagulation; Composite coagulants; Polyaluminium chloride; Polyferric sulphate; Anionic polymer

* Corresponding author.