The effect of suspended matter concentration on the coagulation–flocculation and decantation process for low brackish water \( C_{(\text{NaCl})} = 3 \text{ g/L} \)

L. Cherif\(^{a,b} \), A. Chiboub Fellah\(^{a,b,*} \), F.Z. Chiboub Fellah\(^{c} \), S. Boulefred\(^{c,b} \), L. Benadda\(^{a,b} \)

\(^{a}\)Faculty of Technology, Hydraulic Department, University of Tlemcen, Tlemcen, Algeria, Tel. +213 05 61 39 92 32; email: cheriflamia26@gmail.com (L. Cherif), Tel. +213 05 58 38 99 91; email: chibabghani@yahoo.fr (A. Chiboub Fellah), Tel. +213 07 73 70 36 90; email: lotfissb@yahoo.fr (L. Benadda)

\(^{b}\)University of Tlemcen Research Laboratory No. 60: Valorization of Water Resources “V.R.E”, BP 230, Tlemcen 13000, Algeria, Tel. +213 43 41 00 13; Fax: +213 28 56 85

\(^{c}\)Faculty of Sciences, Department of Chemistry, University of Tlemcen, Tlemcen, Algeria, Tel. +213 05 58 96 41 69; email: cfatema@yahoo.fr (F.Z. Chiboub Fellah), Tel. +213 05 53 27 72 24; email: shino-inata@hotmail.fr (S. Boulefred)

Received 12 February 2014; Accepted 29 March 2015

ABSTRACT

This work fits within the pretreatment of brackish water before treatment by reverse osmosis. Our objective was to study the influence of coagulation–flocculation and decantation technique on suspended matter concentrations in brackish water. Tests were conducted in jar tests by varying the coagulant dose, the flocculant dose, and the pH of the medium. A first jar test series conducted on brackish water samples of low salt concentration with different initial concentrations of suspended matter has shown that aluminum sulfate remains the most interesting compound for the suspended matter removal, and determining the optimum dose of coagulant is very difficult for low turbidity water. Then, a second jar test series carried out with a mixture of aluminum sulfate and the polymer showed the influence of molecular weight and the degree of cross-linking polymers on treatment efficacy. In fact, a phase of study was conducted focusing on determined optimal concentration of coagulant and flocculant which aims to evaluate the pH effect on the removal of suspended matter. Finally, some tests have been carried out on the pilot “TE 600”, and then, we compared the given results within those found in the jar test.

Keywords: Brackish water; Coagulation–flocculation; Jar test; Pilot

*Corresponding author.

Presented at the 3rd Annual International Conference on Water (CLEAU 2013), 18–20 November 2013, Algiers, Algeria

1944-3994/1944-3986 © 2015 Balaban Desalination Publications. All rights reserved.