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A Multiparameter Colloidal Titrations for the Determination of Cationic Polyelectrolytes

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ABSTRACT

In water treatment processes and conditioning drinking water, PEs are widely used; however, their environmental impact is still doubtful, since residual concentrations increase organic matter content and represents a potential health hazard. This paper demonstrates a multiparametric study of two colloidal titration methods: spectrophotometric and zeta potential end point detection. The first one was optimized to guarantee the accuracy of cationic commercial PE quantification. It includes the indicator dose optimization using analytical criteria for competing equilibria, a calibration curve for two ranges of CPE concentration (1 - 5 ppm and 5 - 100 ppm) and the interference study of flocculant and Sn in the CPE quantification. The second method provides a physicochemical validation of the electric surface phenomena occurring during the colloidal titration and the end point detection. As an additional contribution the zeta potential titration was discussed and proposed as an alternative method for quantifying CPE when the sample is metal free.

KEYWORDS

Polyelectrolyte Quantification; Colloidal Titration; Zeta Potential, Polydadmac; O-Toluidine Blue Indicator; Wastewater Treatment

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