Control of barium sulfate crystallization in the presence of additives

Emel Akyol*, Özge Aras, Mualla Öner*

Department of Chemical Engineering, Yildiz Technical University, Davutpasa Istanbul, 34210 Turkey
Tel. +90 2123834740; Fax: +90 2123834725; emails: eakyol@yildiz.edu.tr; oner@yildiz.edu.tr

Received 20 February 2013; Accepted 21 May 2013

ABSTRACT

The aim of the present work was to investigate the influence of various experimental parameters on inhibiting the crystallization process, size, and morphology of barium sulfate crystals in the presence of polyelectrolytes. The results indicated that the experimental parameters, such as the concentration of the polymer, the pH of solution, the ratio $[\text{Ba}^{2+}]/[\text{SO}_4^{2-}]$, and temperature, are important for the inhibiting of the crystallization process, size, and morphology of barium sulfate crystals. The effects of all these parameters on the morphologies and crystallization of barium sulfate can be attributed to their influence on the interaction between the carboxylic acid groups of polyelectrolytes and the crystal surface.

Keywords: Barium sulfate; Crystal morphology; Control of crystallization process; Polyelectrolytes

*Corresponding author.