



Investigations on the evaluation of polymeric calcium sulfate dihydrate (gypsum) scale inhibitors in the presence of phosphonates

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ABSTRACT

The effects of polymers with different architecture, phosphonates, and polymer/phosphonate blends on precipitation of calcium sulfate dihydrate (gypsum) precipitation are reported in this paper. It has been found that gypsum inhibition by polymers strongly depends on polymer architecture. Among the various phosphonates (i.e., aminotris(methylene phosphonic acid), AMP; 1-hydroxyethylidene 1,1-diphosphonic acid, HEDP; 2-hydroxyphosphono acetic acid, HPA; and 2-phosphonobutane 1,2,4-tricarboxylic acid, PBTC); tested AMP shows the best inhibition for gypsum precipitation. It has also been observed that presence of PBTC exhibits synergistic effect on the performance of polymers containing carboxyl group. Under the experimental conditions used, no synergistic effects were observed with polymer/phosphonate (AMP, HEDP, HPA) blends.

Keywords: Polymers; Phosphonates; Calcium sulfate; Precipitation; Inhibition; Synergism
