Experimental study of catalytic effect of different forms of zinc on ferrous iron oxidation in a bubble column reactor using ionic, oxide, and oxide nanopowder of zinc

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ABSTRACT

In this investigation, catalytic effect of zinc compounds (in ionic, oxide, and oxide nanopowder forms) on oxidation of ferrous iron by aeration in a bubble column reactor was studied experimentally. Effects of various zinc forms were compared with each other. As experimental results showed, zinc oxide nanopowder is the most effective form on oxidation reaction; which oxidation yield at 20 ppm of zinc and time 70 min increases about 17\% compared to no using of zinc. Also zinc oxide and ionic zinc, respectively, enhance the oxidation rate. In addition, oxidation rate of ferrous iron increases with increasing concentration of each forms of zinc.

Keywords: Catalytic effect; Ferrous iron; Nanoparticle; Oxidation rate; Zinc