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The influence of wave frequency of solenoid magnetic field on $CaCO_3$ scale formation in piping system

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ABSTRACT

In the current research, the influence of frequency 10; 100; 1000 Hz square wave of solenoid magnetic field on $CaCO_3$ scale formation in piping system was investigated. $CaCO_3$ scale was synthesized by $CaCl_2.2H_2O$ and Na_2CO_3 in the stoichiometry calcium solution was set at 3,500 ppm To inhibit the scale, citric acid ($C_6H_8O_7$) was added to calcium solution in meager degree, i.e. 5.00 and 10.00 ppm. This experiment was conducted by in house experimental rig completed by computer program to control the experiment parameters,flow rate at 30 ml/minute; temperature at 30°C. Induction time was found as 17; 16 and 13 minute for the experiment of 10:100:1000 Hz respectively. Deposition rate was found as 0.0525; 0.0655 and 0.0790gr/hr for the experiment of 1,000 Gauss respectively. The polymorph of the scale was characterized by SEM to investigate the morphology of the crystal phases through shape and dispersion method. The result shows that vaterite predominates the phases.

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