Inhibition of CaCO₃ scale formation in ground waters using mineral phosphates

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ABSTRACT

The present work examines the effect of two mineral inhibitors on the CaCO₃ precipitation in two Algerian ground waters. The main objective was to reduce the scaling power and then to prevent the fouling phenomenon met in the equipments supplied by these waters. It was shown that, for a large rang of temperature, Hamma water is more scale-forming water than the one of Negrine because its lower content in foreign ions to the calcocarbonic system, especially magnesium. Chronoamperometry tests show that the antiscale treatment with mineral phosphates is more efficient for the Hamma than Negrine water. Tested inhibitors affect strongly the nucleation-growth kinetics in the case of Hamma water and only the scale compactness in Negrine water. This was attributed to the difference in the chemical composition of the studied waters. Besides, it was shown that polyphosphate is more efficient as scaling inhibitor than the dihydrogenophosphate ions.

Keywords: Drinking water; Hardness; Calcium carbonate; Inhibition; Mineral phosphates; Precipitation

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