

Application of Chemical Tests for the Inhibition of Scaling From Hamma Hard Waters

Authors : Samira Ghizellaoui, Manel Boumagoura

Abstract : Calcium carbonate precipitation is a widespread problem, especially in hard water systems. The main water supply that supplies the city of Constantine with drinking water is underground water called Hamma water. This water has a very high hardness of around 590 mg/L CaCO₃. This leads to the formation of scale, consisting mainly of calcium carbonate, which can be responsible for the clogging of valves and the deterioration of equipment (water heaters, washing machines and encrustations in the pipes). Plant extracts used as scale inhibitors have attracted the attention of several researchers. In recent years, green inhibitors have attracted great interest because they are biodegradable, non-toxic and do not affect the environment. The aim of our work is to evaluate the effectiveness of a chemical antiscaling treatment in the presence of three green inhibitors: gallic acid; quercetin; alginate, and three mixtures: (gallic acid-quercetin); (quercetin-alginate); (gallic acid-alginate). The results show that the inhibitory effect is manifested from an addition of 1mg/L of gallic acid, 10 mg/L of quercetin, 0.2 mg/L of alginate, 0.4mg/L of (gallic acid-quercetin), 2mg/L of (quercetin-alginate) and 0.4 mg/L of (gallic acid-alginate). On the other hand, 100 mg/L (Drinking water standard) of Ca²⁺ is reached for partial softening at 4 mg/L of gallic acid, 40 mg/L of quercetin, 0.6mg/L of alginate, 4mg/L of (gallic acid-quercetin), 10mg/L of (quercetin-alginate) and 1.6 mg/L of (gallic acid-alginate).

Keywords : water, scaling, calcium carbonate, green inhibitor

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