

Abstract

The biooxidation of sulfide under denitrifying conditions is a key process in the control of souring in oil reservoirs and in the treatment of gas and liquids contaminated with sulfide and nitrate. The effect of nitrate injection on the microbial community has been evaluated in the setting of offshore oil industry production, but has not been studied onshore, such as in the Algerian oilfields. A consortium of sulfate-reducing bacteria (SRB) was isolated by first inoculating saline Postgate's medium C with injection water obtained from the In Amenas oil field, situated in the South Eastern Algerian Sahara, and then exposing the test solution to sulfate. When nitrate was dosed at 120 mg/l it was reduced by this bacterial consortium, with some ammonium production. This mechanism could be important in oilfield systems where nitrate is applied to prevent sulfide generation by SRB that leads to reservoir souring. In static tests, the influence of this SRB consortium on corrosion was assessed using carbon steel coupons, in the presence of sulfate alone and sulfate with 120 mg/l nitrate. The results of the static test indicate that the occurrence of pitting corrosion was fairly low under this condition. This is the first report on the use of nitrates in the fight against corrosion in the Algerian oil industry