Effect of ferrous sulfate treatment on microbially influenced corrosion of CuNi 70/30 alloy by sulfate reducing bacteria

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Supplementary Data

Table 1s. Chemical composition of the potable water and natural seawater used for $FeSO_4$ solution preparation in this study.

Test	Units	Seawater	Potable water
Chloride	mg/L	11000	9.1
Calcium	mg/L	250	4.5
Magnesium	mg/L	750	1.6
Potassium	mg/L	250	0.8
Sodium	mg/L	6100	5.6
Iron	mg/L	< 0.05	< 0.05
Phosphate	mg/L	0.07	<0.05
Sulphate	mg/L	1600	<5
Nitrate	mg/L	0.40	0.37
Salinity	mg/L	23000	90
Total alkalinity	mg/L	120	< 20
Total organic carbon	mg/L	< 5	< 5
pH	pH units	7.9	6.6
Conductivity	µS/cm	39000	78

Table 2s. Chemical composition of agar plates used for spread plating SRB cells.

Chemical	Amount (per L)
Tryptic soy agar	45.0 g
$MgSO_4.7H_2O$	2.0 g
Sodium lactate	4 mL
5% $Fe(NH_4)_2(SO_4)_2$	0.05 %

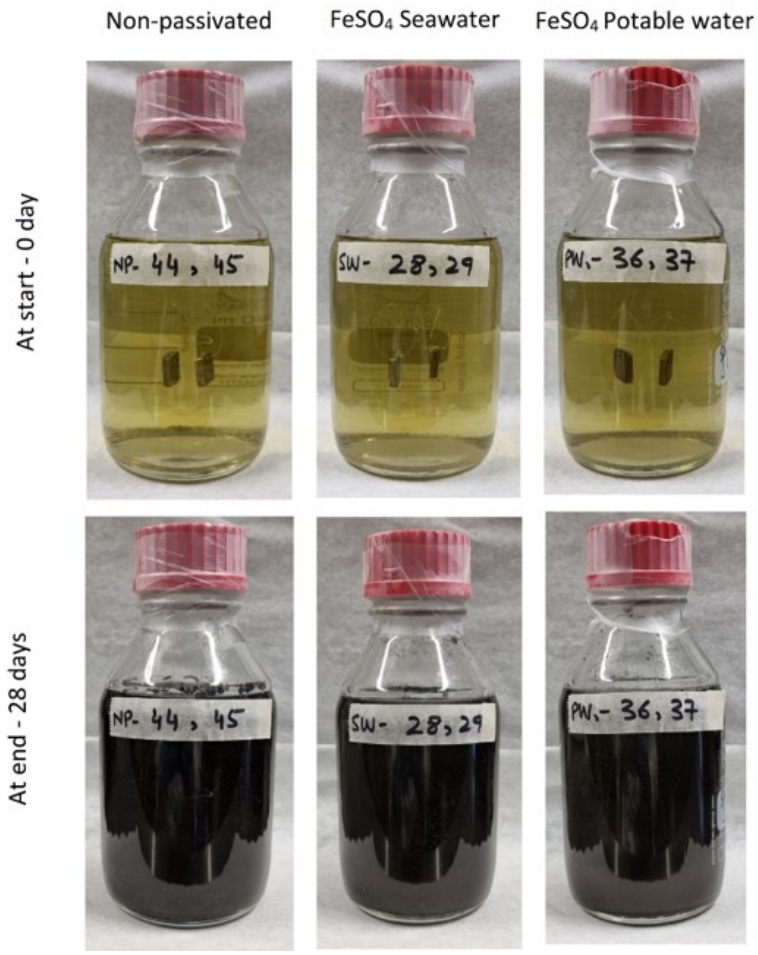


Figure 1s. A photo showing example of different coupons suspended inside glass bottles during both the initial and final stages of a 28 day immersion test in MB medium with SRB.

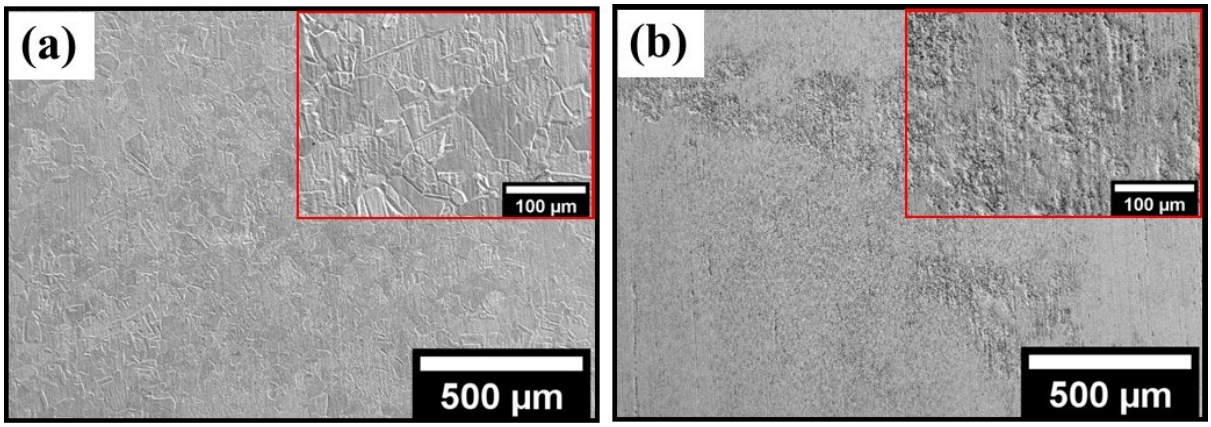


Figure 2s. SEM images after removal of surface film formed on coupons treated with (a) $FeSO_4$ seawater and (b) $FeSO_4$ potable water for 5 days. The insets provide higher magnification images of the corresponding coupon surface.

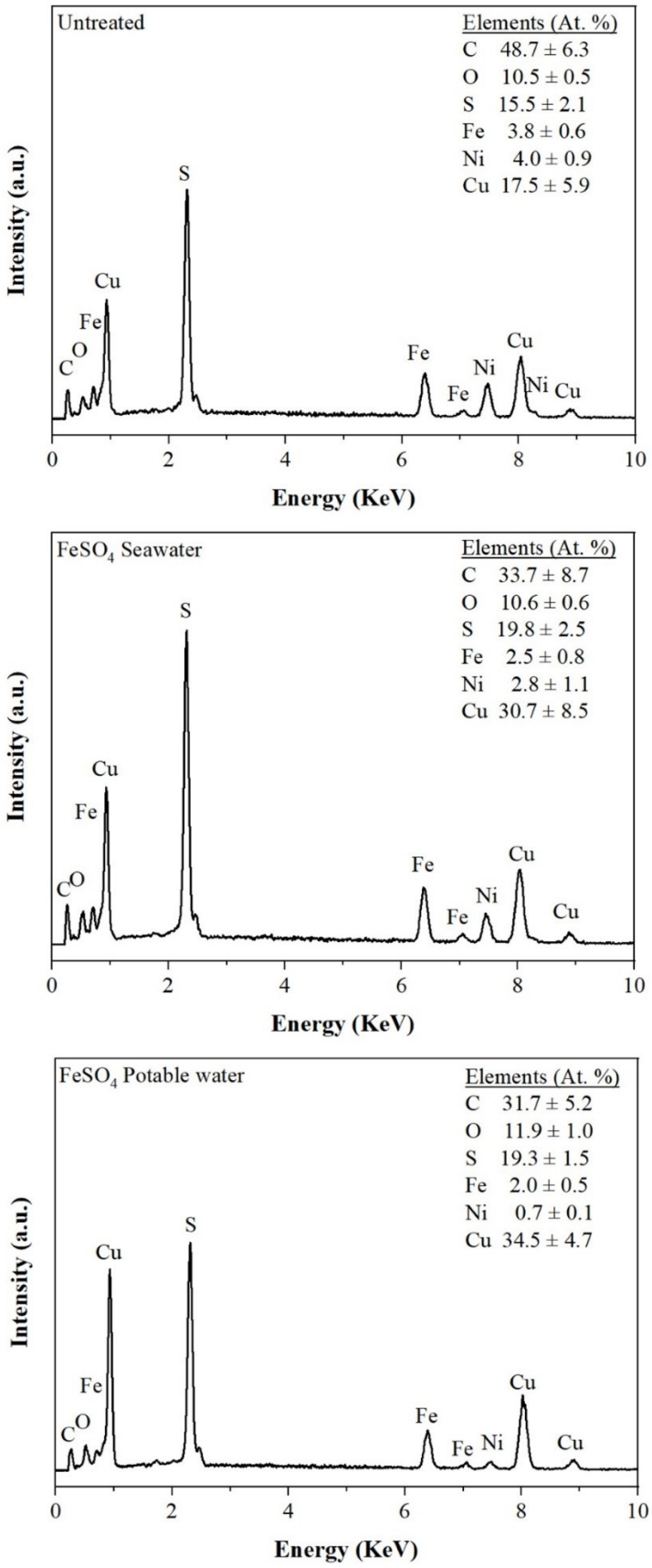
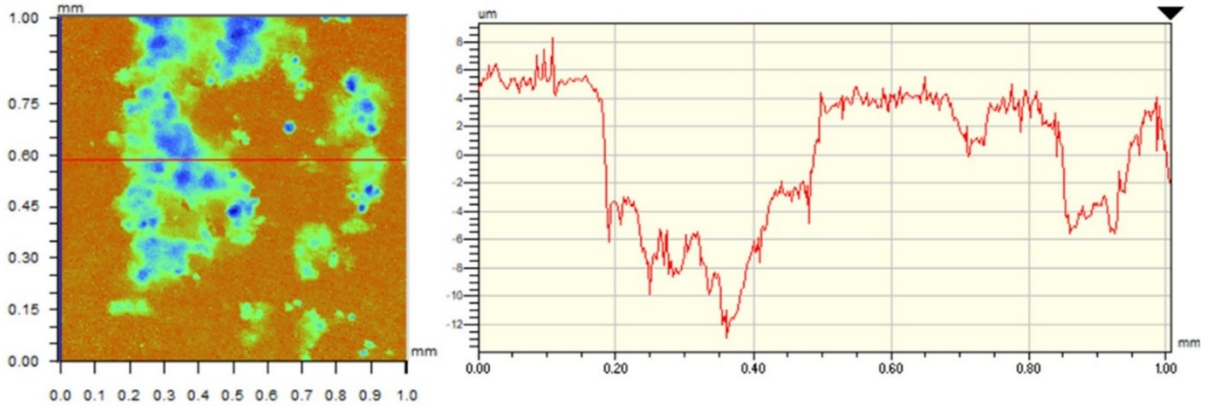


Figure 3s. EDS spectra of biofilm formed on untreated and $FeSO_4$ treated coupons after 28 days of immersion testing in MB medium with SRB.

(a) $FeSO_4$ seawater treated coupon



(b) $FeSO_4$ potable water treated coupon

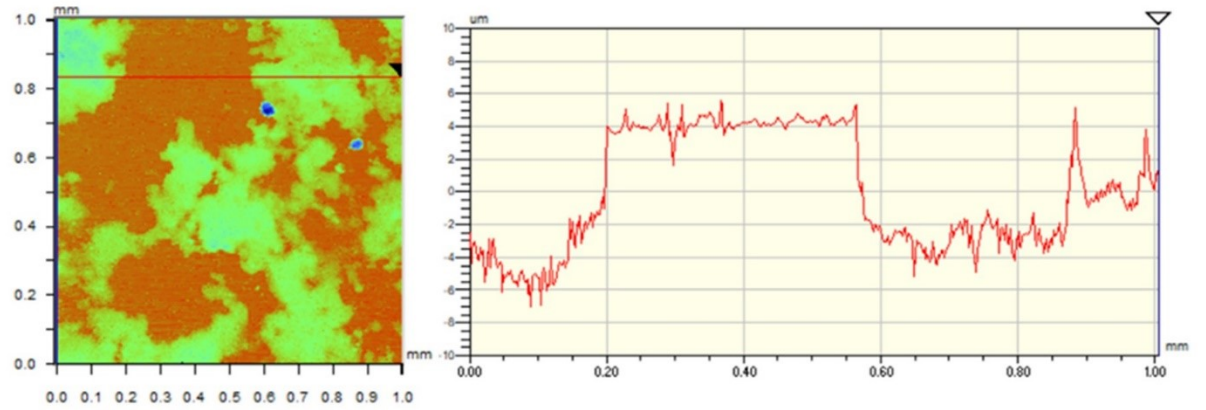


Figure 4s. 3D optical profilometer images (left) and horizontal line profiles (right) showing extent of general (uniform) corrosion attack on the surface of (a) $FeSO_4$ seawater treated coupon (b) $FeSO_4$ potable water treated coupon.

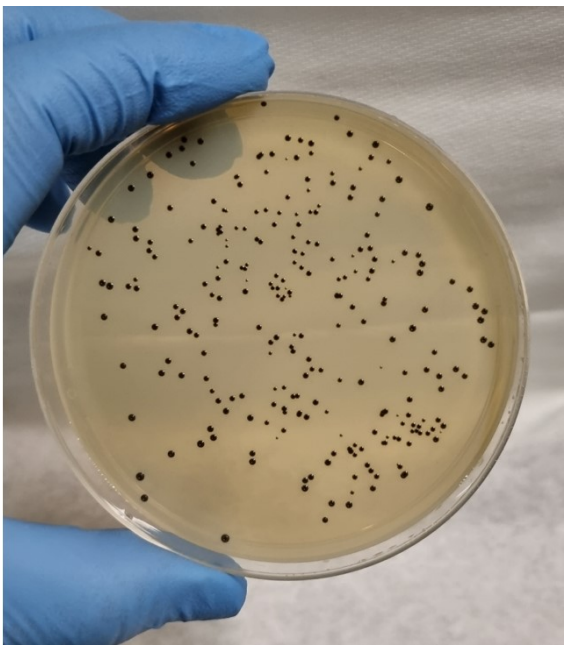


Figure 5s. Example of black color SRB colonies grown on TSA plus salt medium agar plates.