From defence to damage: The impact of seawater passivation on microbially influenced corrosion in CuNi 70/30 alloy

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Supplementary Data

Table S1. Chemical composition of the natural seawater used for passivation and corrosion testing in this study.

Test	Units	Seawater
Chloride	mg l^{-1}	20000
Calcium	mg l^{-1}	540
Magnesium	mg l^{-1}	1600
Potassium	mg l^{-1}	530
Sodium	mg l^{-1}	10000
Iron	mg l^{-1}	< 0.05
Phosphate	mg l^{-1}	0.08
Sulphate	mg l^{-1}	2600
Nitrate	mg l^{-1}	< 0.02
Total alkalinity	mg l^{-1}	170
Total organic carbon	mg l^{-1}	< 5
pH	pH units	8.0
Conductivity	µS cm^{-1}	63000

Table S2. EDS elemental composition of non-passivated and seawater passivated samples.

Sample types	Elemental composition (at %)					
	Cu	Ni	Fe	Mn	Cl	O
Non-passivated	65.7 ± 0.1	32.7 ± 0.3	0.6 ± 0.1	1.0 ± 0.1	-	-
Seawater passivated	44.7 ± 0.4	23.6 ± 0.2	0.6 ± 0.0	0.7 ± 0.0	0.3 ± 0.1	30.1 ± 0.4

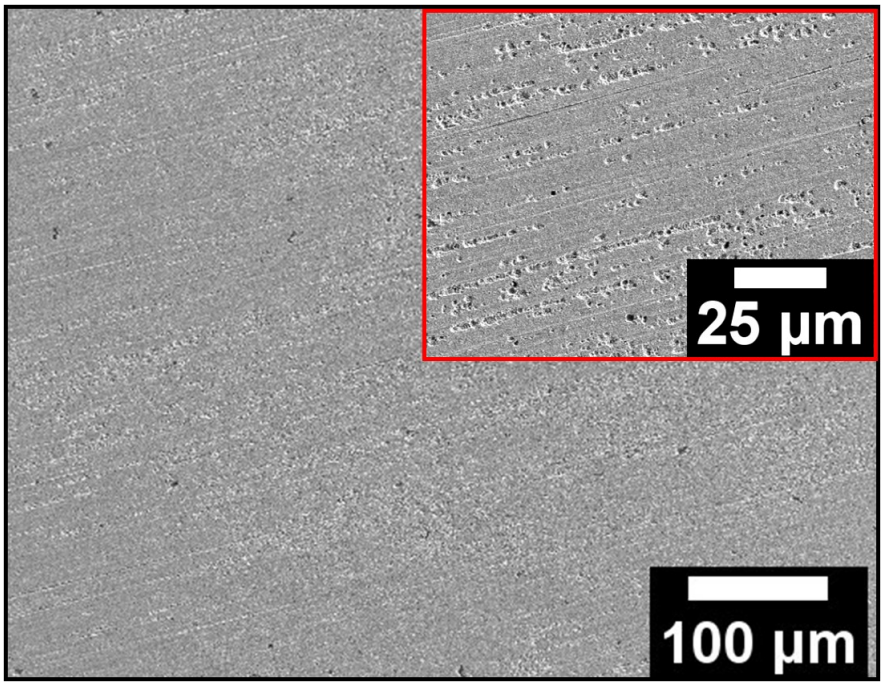

Fig. S1. SEM images after removal of surface film formed on seawater passivated samples for 35 days. The insets provide higher magnification images of the corresponding coupon surface.

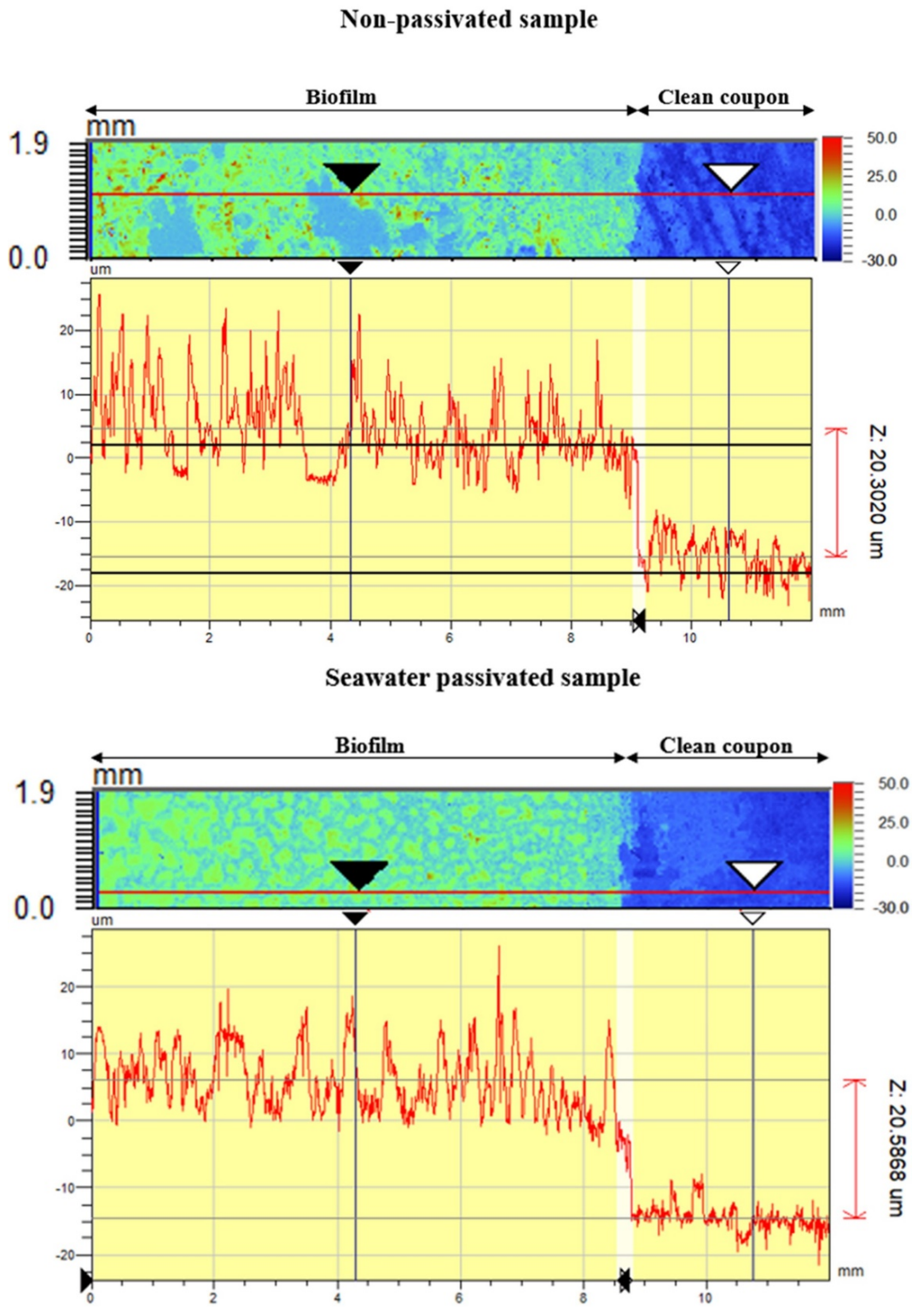

Fig. S2. 3D optical profilometer images showing biofilm thickness on the non-passivated and seawater passivated samples following immersion in SRB inoculated MB medium for 28 days. The regions on the right-hand side of the images represent areas where the biofilm was removed, revealing the CuNi alloy surfaces.

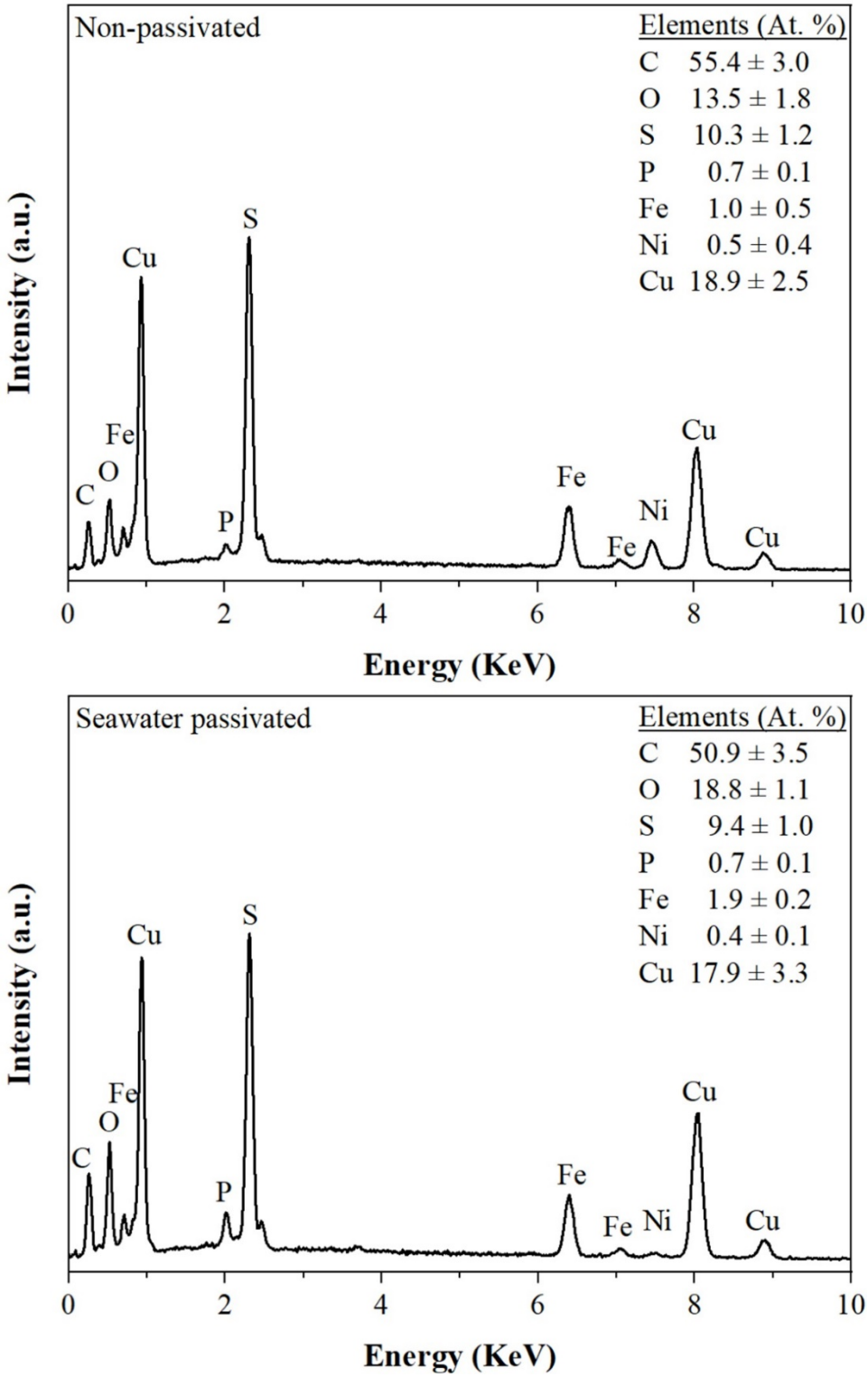

Fig. S3. EDS spectra of biofilm formed on the non-passivated and seawater passivated samples following immersion in SRB inoculated MB medium for 28 days.