Improved Corrosion Resistance of Ni- Mo Nanocomposite Coating Deposed By Electrodeposion Technique.

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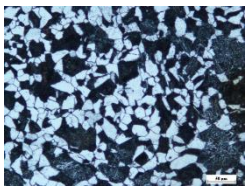
Abstract

In the present work, Ni-Mo coating was disposed by electrodeposition technique using direct current to form nanocrystal coating on the mild steel and stainless steel. Different concentration of HCl solution were used to evaluated the corrosion behavior. The electrodeposition technique present a good alternative to create protective coating against corrosion than the physical method.

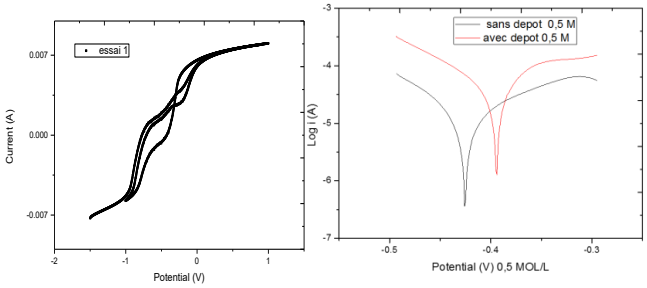
To enhance physico-chemical and mechanical characteristics of the molybdenum in the Ni nanocomposite coating, the synthesis of coating was elaborated and the electrochemical and mechanical characterization was accomplished.

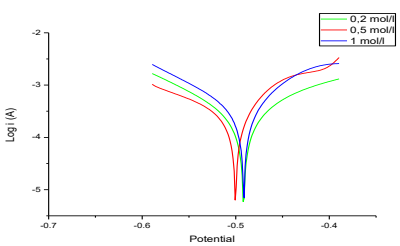
I-Elaboration and characterization of thin protective layers

Mild steel



II- Electrochemical test:





1-Mild steel with deposit:

HCL M/L	Ecorr (v)	I corr (A)	RP (Ω)	Ba(v/dec)	Bc(v/dec)	Corrosion rate (mm/year)
0.2	-0.49201	0.0007020	83.392	0.2999	0.24489	8.158
0.5	-0.42248	0.0005153	63.575	0.60408	0.08620	5.9881
1	-0.46285	0.0005872	51.681	0.20404	0.10629	6.8239

2- Mild steel without deposit:

HCL M/L	Ecorr (v)	I corr (A)	RP (Ω)	Ba(v/dec)	Bc(v/dec)	Corrosion rate (mm/year)
0.2	-0.48211	-0.000863	33,592	0.32319	0.08414	10.029
0.5	-0.44424	0.0034464	42.828	0.72298	0.95397	32.047
1	-0.44211	0.031099	18.983	-0.81616	0.50997	34.37
1.5	-0.43026	0.0032564	39.207	0.61264	0.56518	37.839

Conclusion :

The electrodeposition technique presents a good alternative to create a protective coating against corrosion compared to the physical method.

the results obtained show an improvement in the corrosion resistance of the material: the thicknesses of the coatings produced are of the micrometric order.

Corrosion tests revealed that Ni-MO coatings have good corrosion resistance.