NOUVELLES VOIES D'INHIBITION DE LACORROSION DES ACIERS PLUSRESPECTUEUSES DE L'ENVIRONNEMENT

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Abstract : In order to limit the degradation of steels in service, surface treatments are applied. The combination of different layers to protect materials against corrosion in a sustainable manner. Based compounds of hexavalent chromium have always been the most used in the aerospace industry because they are simple to implement and are recognized as the most effective inhibitors of steel corrosion. Recent European directives state that the use of compounds containing hexavalent chromium must be reduced or eliminated in the very near future, asthey have been recognized carcinogenic to humans and toxic to the environment. Manystudies have been made in recent years, but today, most alternatives do not pose the samelevel of performance as methods based on hexavalent chromium. An alternative treatmentspassivation uses rare earth oxides, in particular the Ce use the latter as an inhibitor to replace hexavalent chromium is characterized by forming thin layers is generally associated with theformation of oxides or hydroxides cerium cathodic sites of the metal surface. Theelectrochemical characterization of the inhibition process was evaluated in harshenvironments such as 0.1 M NaCl, 0.1M Na2SO4 and industrial water. Thus, the corrosionresistance obtained on steel A 366 was studied. For all samples, the duration of protection wasassessed by measurement of Ecorr. In parallel, the efficacy is monitored by measuring thepolarization resistance, the corrosion current density of the lines extrapolated from Tafelelectrochemical impedance spectroscopy. In conclusion, the results of analytical andelectrochemical techniques have shown that cerium may very well and with similar efficacy replaced hexavalent chromium.

Keywords : corrosion, cerium, chrome, inhibiteur de corrosion