

# 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, as they have been recognized carcinogenic to humans and toxic to the environment. Many studies have been made in recent years, but today, most alternatives do not pose the same level of performance as methods based on hexavalent chromium. An alternative treatment passivation 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 the formation of oxides or hydroxides cerium cathodic sites of the metal surface. The electrochemical characterization of the inhibition process was evaluated in harsh environments such as 0.1 M NaCl, 0.1M Na<sub>2</sub>SO<sub>4</sub> and industrial water. Thus, the corrosion resistance obtained on steel A 366 was studied. For all samples, the duration of protection was assessed by measurement of  $E_{corr}$ . In parallel, the efficacy is monitored by measuring the polarization resistance, the corrosion current density of the lines extrapolated from Tafel electrochemical impedance spectroscopy. In conclusion, the results of analytical and electrochemical techniques have shown that cerium may very well and with similar efficacy replaced hexavalent chromium.

**Keywords :** corrosion, cerium, chrome, inhibiteur de corrosion