

Inhibition of the Corrosion of Copper in 0.5 NaCl Solutions by Aqueous Extract and Hydrolysis Acid of Olive Leaf Extract

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Abstract : Oleuropein-rich extract from olive leaf and acid hydrolysates, rich in hydroxytyrosol and elenolic acid was prepared under different experimental conditions. These phenolic compounds may be used as a corrosion inhibitor. The inhibitive action of these extracts and its major constituents on the corrosion of copper in 0.5 M NaCl solution has been evaluated by potentiodynamic polarization, electrochemical impedance spectroscopy (EIS) and weight loss measurements. The product of extraction was analyzed with high performance liquid chromatography (HPLC), whose analysis shows that olive leaf extract are greatly rich in phenolic compounds, mainly Oleuropeine (OLE), Hydroxytyrosol (HT) and elenolic acid (EA). After the acid hydrolysis and high temperature of extraction, an increase in hydroxytyrosol concentration was detected, coupled with relatively low oleuropeine content and high concentration of elenolic acid. The potentiodynamic measurements have shown that this extract acts as a mixed-type corrosion inhibitor, and good inhibition efficiency is observed with the increase in HT and EA concentration. These results suggest that the inhibitive effect of olive leaf extract might be due to the adsorption of the various phenolic compounds onto the copper surface.

Keywords : olive leaf extract, oleuropein, voltammetry, copper, corrosion, HPLC, EIS

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