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Comparative study of corrosion of iron in cyanide and thiourea media in hydrometallurgical processes

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The aim of this investigation was to assess the potential of corrosion of ASTM A36 steel specimens means cyanide and thiourea in two different concentrations used in leaching processes, by polarization curves at room temperature (298 K). Furthermore, evaluate the surface state of the accelerated corrosion caused by electrochemical measures of SEM microscopy studies. To develop the experiment was used as research material specimens ASTM A36 steel, obtained from pieces of this material are used in the manufacture of a leaching reactors industry processing plant. Square samples of 2 cm by side and 0.3 cm thick were used. The weight and dimensions necessary to calculate the surface area and the initial value of the weight for the corrosion tests samples and weight loss was determined. As corrosive medium was used cyanide and thiourea industrial grade obtained from a local company. The samples subjected to corrosion tests were analyzed using scanning electron microscopy to observe the characteristics of the surface with a Phenom Pro desktop Scanning electron microscope (SEM). Electrochemical tests were performed with a CH Instruments potentiostat model 700D. The results of the corrosion potential of -0.32 V was for steel in sodium cyanide 0.62 g/l and thiourea -0.47 v to 0.96 g/l. For his part for concentrations of sodium cyanide 0.80 g/L thiourea 1.24 g/L corrosion potentials were -0.34 V and -0.49 V respectively. This allows us to conclude that metal ASTM A36 steel samples have higher corrosivity thiourea solutions compared with solutions of sodium cyanide.

Biography

Hugo Romero has completed the Master's program in Chemistry at the Catholic University of Valparaiso, Chile. He works as a researcher and Professor at the Faculty of Chemistry at the Technical University of Machala, Ecuador, where he has served as Director of Chemical Research Center and Director of the Center for Technology Development. His research lines are Corrosion and Applied Electrochemistry. He has published about 10 papers in reputed journals such as Progress in Organic Coatings, Talanta, Advances in Chemistry and Analytical Chemistry Research.

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