

Behaviour of a copper-AISI 304 stainless steel mixed anode in electrolytic copper refining with periodic current reversal

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Abstract

In the search for suitable materials to be used as anode supports in the periodic current reversal refining process this work covers the study of austenitic AISI 304 stainless steel. Experimental results show that the resistance of this steel to the aggressive action of the refining electrolyte is good at the working temperature of 60°C since no corrosion was detected after 24 h of electrolysis. The periodic polarization of this material results in a progressive passivation which was observed by operating under different initial surface conditions and by detecting remnant anodic currents which gradually decreased with time. For time ratios lower than twenty, a build up of metallic copper deposit on the steel part of the mixed anode occurred whatever the current density used.

Keywords Stainless Steel, Copper Deposit, Initial Surface, Anodic Current, Refining Process