Effect of Extrusion Texture on Corrosion Behaviour of D16T Drill Pipe in 3.5% NaCl Solution

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The role of texture in the initiation and expansion of corrosion pits for a D16T aluminium drilling pipe in 3.5% NaCl solution was investigated by immersion and electrochemical tests. The results revealed that the surface parallel to the extrusion direction has typical brass {110} <112> and copper {112} <111> grain orientations, and the surface perpendicular to the extrusion direction has typical {112} <110>, {111} <112> and {001} <100> grain orientations. The <211> orientation sub-grain and sub-grain/deformed grain were found to be responsible for the initiation of circular corrosion pits. Furthermore, the surface parallel to the extrusion direction presents a better corrosion resistance and pitting resistance than the surface perpendicular to the extrusion direction in 3.5% NaCl solution.

Keywords: aluminium alloy drill pipe, extrusion texture, corrosion behaviour, Pitting density

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