ABSTRACT

THE INFLUENCE OF TORQUE AND ANIL-QUENCH TO STRESS CORROSION CRACKING (SCC) OF AISI 304SS BOLT IN $MgCl_2$ ENVIRONMENT LIQUID IN TEMPERATURE 150 ° C

By

Yoan Saputra

The influence of torque and anil-quench to stress corrosion cracking of AISI 304SS bolt in environments containing MgCl2 in temperature 150 ° C with variation of the immersion time 3 days, 5 days, and 7 days and the variation of the load torque of 0 Nm, 20 Nm, 40 Nm, and 60 Nm has been examined. Characteristics and morphology of the specimen cracks with/without load torque in the analysis using optical microscope (OM), scanning electron microscopy (SEM) / energy dispersion spectroscope (EDS), and X-ray diffraction (XRD).

Pore surface roughness and defects formed during the administration of bolt torque on the edge of the trigger crack initiation and propagation during immersion into boiling magnesium chloride solution. Based on the images of micro structure and topology bolt fracture specimens, the cracks of transgranular and intragranular formed was originally derived from the edge of the bolt head and eventually spread to the direction transverse (radial). As for the annealed sample experiencing above-quench sensitization temperature is at a temperature of 1050 ° C was not observed any cracks on the bolt, annealing-quench capable of preventing SCC of the specimen so that the chromium kabrida will dissolve into the grain and could not happen precipitation.

EDS analysis results show oxygen and chloride was detected on the surface area of the fracture as corrosion products. Protective layer of chromium oxide is formed on the bolt head marred by chloride that diffuses into the through layers of chrome and consequently oxygen ions diffuse out of iron and nickel to form iron oxide and nickel oxide.

Keywords: bolt AISI 304SS, a solution of magnesium chloride, stress corrosion cracking, transgranular and intergranular cracks.