INFLUENCE OF CARBIDE PRECIPITATION CAUSED BY HEAT TREATMENT TO CORROSION RESISTANCE AT STAINLESS STEEL 304 AND 304 L

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ABSTRACT

Inappropriate heat treatment process at austenitic stainless steel can cause corrosion rate decrement in corrosive environment. This is caused by existence of compound of chrome carbide in grain boundary, so that will cause the happening of intergranular corrosion.

This research is learned the influence of holding time variation (30 and 120 minutes) to form carbide precipitation and resistance of corrosion at 304 and 304L stainless steel heated at sensitisation temperature at 600°C.

The experiment based on ASTM 262-98 practice A and Practice B standard, and to find the influence of chromium carbide formation to corrosion resistance in sulphate acid (H₂SO₄) solution, and sea water (simulated by NaCl).

The result of this experiment is the longer holding time thicker carbide precipitation, and higher tendency in intergranular corrosion forming that affect the corrosion rate as well as the concentration of the solution. The higher concentration the higher corrosion rate, with maximum value in 30% H₂SO₄ solution, and decreasing in higher concentration. The corrosion formed is not only intergranular corrosion, but also pitting and general corrosion.

Keyword: Chrom carbide precipitation, intergranular corrosion, sensitisation temperature, holding time, solution concentration, corrosion rate.