

산성용액에서 순수 알루미늄의 양극산화시 발생하는
표면응력에 대한 연구

Surface Stresses Generated during Anodic Oxidation
of Pure Aluminium in Acidic Solutions

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Surface stresses generated during the anodic oxidation of pure aluminium have been examined as a function of applied current density and solution pH in sulfuric acid solutions by using a beam deflection technique. At low applied current densities, only compressive stresses were generated, while at high current densities tensile stresses were observed during the growth of porous anodic oxide film in the acidic solutions. The stresses were observed to be more compressive with decreasing pH, resulting from higher concentration of cation vacancy in the oxide film formed in more concentrated acidic solution. There was no change in stress from compressive to tensile with time during the anodic oxidation of pure aluminium at constant current density in the acidic solutions. Based upon the experimental results, it is suggested that annihilation of aluminium vacancies and formation of oxygen vacancies at the aluminium/oxide interface result in compressive and tensile stresses during the anodic oxidation of pure aluminium in the acidic solutions, respectively.

References

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