

Corrosion Phenomena of Alloys by Subcritical and Supercritical Water Oxidation of 2-Chlorophenol in Continuous Anti-Corrosive Reactor System

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In the last two decades, supercritical water oxidation (SCWO) has been actively developed as a means of destroying hazardous organic waste. However, supercritical water oxidation should overcome the corrosion problem for the successful industrial application and it has been also difficult to investigate the corrosion of target material because of the corrosion problem of the reactor body. In this study, corrosion phenomena were investigated at the subcritical and supercritical conditions by using continuous type anti-corrosive SCWO reactor system. Hastelloy C-276, zirconium 702, and Titanium Gr2 were selected as tested materials. AES-SAM was used to conduct the surface chemical analysis. Oxygen penetration was found at both subcritical and supercritical conditions and the penetration depth was deeper at the supercritical condition. It was also found that the corrosion phenomena of metal alloy were more significant as the concentration of the waste water became higher and the reaction time became longer.