
Electrochemical corrosion behavior of austenitic stainless steels and titanium alloys in aqueous vitamin B6 hydrochloric solution

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Abstract The electrochemical corrosion behaviors of austenitic stainless steels (304, 316, 316L, 904L) and titanium alloys (TA2, TA9, TA10) in aqueous solution of vitamin B6 hydrochloride at different temperatures were studied by electrochemical corrosion test. The results indicate that austenitic stainless steels and titanium alloys had relatively negative corrosion potentials (austenitic stainless steels: $\sim -0.50\text{V}$; titanium alloys: $\sim -0.45\text{V}$) at different temperatures; as the temperature raise, the corrosion current density of austenitic stainless steels increased by one order of magnitude, while those of titanium alloys changed slightly. The polarization curves showed a distinct passivation behavior and the passivation range of titanium alloys were much wider than those of austenitic stainless steels. Specifically, austenitic stainless steels were more sensitive to temperature than titanium alloys and the corrosion resistance of titanium alloys were superior to that of austenitic stainless steel.

Keywords corrosion; vitamin B6 hydrochloride; stainless steels; titanium alloys