Analysis of corrosion weight loss of ZL114A aluminum alloy under accelerated corrosion environment spectrum in laboratory

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Abstract In this paper, the corrosion weight loss law and corrosion morphology of ZL114A aluminum alloy were studied by laboratory accelerated corrosion test. Based on the actual atmospheric environment data in Wanning, Hainan Province, two kinds of laboratory accelerated corrosion solutions (pH=2 and pH=3) were developed, and the periodic immersion tests of 48 hours, 288 hours and 384 hours were carried out. After the test, the corrosion products on the surface of the test piece were removed according to the relevant standards, the corrosion weight loss of the test piece under different corrosion time was measured, and the surface corrosion was observed. The experimental results show that the corrosion weight loss of ZL114A aluminum alloy increases linearly with the increase of corrosion time under the action of accelerated corrosion environment spectrum in the laboratory. The weight loss rate of the specimen in the accelerated corrosion solution with pH=2 is greater, and the corrosion degree is more serious. The corrosion morphology of the specimen surface is mainly pitting corrosion, and the degree of surface damage tends to be serious with the increase of corrosion time and the acidity of accelerated corrosion solution. The number and size of pitting pits increase, and the surface roughness of the specimen increases. Under the action of accelerated corrosion environment spectrum in laboratory, the corrosion weight loss of ZL114A aluminum alloy is affected by both corrosion time and solution pH, and is linearly correlated with corrosion time.

Keywords ZL114A aluminum alloy; Accelerated corrosion; Periodic infiltration; Corrosion weight loss; Corrosion morphology; pitting corrosion

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