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时效制度对7475铝合金挤压件组织与性能的影响

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摘要:通过对不同时效制度下的常温拉伸性能、硬度、电导率、抗应力腐蚀性能等的测试及微观组织的观察,分析了不同时效制度对7475铝合金挤压型材的微观组织与综合性能的影响.研究表明,单级峰值时效(T6)具有很高的强度,但抗应力腐蚀性能较差;双级时效(T76, T73)由于晶界析出物呈粗大和孤立分布,具有较强的抗应力腐蚀性能,但由于过时效时晶内析出相尺寸增大,强度有较大幅度的下降;沿变形方向带状分布的粗大难熔硬相质点对合金塑性有较大影响,是断裂过程中裂纹的主要发源地.

关键字: 时效; 力学性能; 应力腐蚀; 微观组织

Effects of aging on microstructure and properties of 7475 alloy extrusions

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Abstract: 7475 alloy is a kind of aluminum alloy with high strength. It is mainly used for construction parts of air planes. The properties, such as tensile properties at room temperature, hardness, conductivity, SCC, and microstructure were systematically studied in this paper. The results show that very high strength, and poor resistance to SCC, were obtained at one-step peak aging. The high resistance to SCC was gained at T76 or T73 temper, a little loss of strength followed. It is believed that the large grain boundary precipitates formed in over-aged condition are favorable to the resistance to the SCC. Coarse particles existing along deformation bands facilitate the nucleation of cracks, thus have poor effect on the ductility.

Key words: aging; tensile property; SCC; microstructure

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