

论文摘要

中国有色金属学报

ZHONGGUO YOUSEJINSHUXUEBAO XUEBAO

第17卷 第2期 (总第95期) 2007年2月

 [PDF全文下载]

文章编号: 1004-0609(2007)02-0248-06

7B04铝合金的时效沉淀析出及强化行为

李志辉, 熊柏青, 张永安, 朱宝宏, 王 锋, 刘红伟

(北京有色金属研究总院 有色金属材料制备加工国家重点实验, 北京 100088)

摘 要: 利用差示量热法(DSC)、透射电镜(TEM)、选区电子衍射(SAED)、常规力学性能测试等手段研究了7B04铝合金时效沉淀析出及强化行为。结果表明: 该材料存在显著的自然时效现象, 大量的GP I区沉淀析出是自然时效强化的主要原因; 合金在120 °C进行人工时效的初期析出大量GP区, 使材料的强度迅速提高, 时效8 h后, 其横向极限抗拉强度即可达到570 MPa, 时效22 h时可达强度峰值点, 此时GP区(包括GP I和GP II区)和 η' 相是主要强化相; 峰值时效后继续延长时效时间, 材料的强度无明显降低, 极限抗拉强度保持在590 MPa左右。

关键字: 7B04铝合金; 时效; 沉淀析出; 强化行为

Ageing precipitation and strengthening behavior of 7B04 aluminum alloy

LI Zhi-hui, XIONG Bai-qing, ZHANG Yong-an, ZHU Bao-hong,
WANG Feng, LIU Hong-wei

(State Key Laboratory for Fabrication and Processing of Nonferrous Metals,
General Research Institute for Nonferrous Metals, Beijing 100088, China)

Abstract: The ageing precipitation and strengthening behavior of 7B04 aluminum alloy were investigated by DSC, TEM, HREM, SAED and tensile testing techniques. The results show that increment of strength during natural ageing at room temperature is related to the dominant formation of GPI zones. During the early stage of artificial ageing at 120 °C, the strong age-strengthening response is due to the precipitation of GP (both GPI and GPII) zones. The peak UTS value is achieved as 570 MPa after ageing at 120 °C for 22 h, both GP (GP I and GP II) zones and η' phase are major precipitates at this stage. After 22 h, the tensile strength changes little (approximate by at 590 MPa) for a relative long time.

Key words: 7B04 aluminum alloy; ageing; precipitation; strengthening behavior

版权所有：《中国有色金属学报》编辑部

地 址：湖南省长沙市岳麓山中南大学内 邮编： 410083

电 话： 0731-8876765, 8877197, 8830410 传真： 0731-8877197

电子邮箱： f-ysxb@mail.csu.edu.cn