



平面撞击对Ti6Al4V合金结构的影响

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Effects of plane shock loading on structure of Ti6Al4V alloy

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摘要

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摘要 采用一级轻气炮对Ti6Al4V合金进行对称与非对称正碰撞冲击,回收冲击样品,并进行电镜扫描和X射线衍射分析。结果表明:随着冲击速度的增加,样品发生不同程度的变形,材料内部产生微裂纹并导致材料发生损伤,而损伤进一步促进了微裂纹的产生、扩展;由X射线分析结果可知,冲击使材料的晶面发育更加完整,并在材料冷却过程中出现一种亚稳态结构,在一定程度上可提高冲击韧性。 更多还原

关键词: [固体力学](#) [晶体结构](#) [平面撞击](#) [Ti6Al4V合金](#) [变形;裂纹](#)

Abstract: Ti6Al4V alloy samples were symmetrically and asymmetrically impacted by using a one-stage light gas gun. The recovered samples were analyzed by the scanning electron microscopy and X-ray diffraction. Results indicate that with the increasing of the impact speeds, the samples are distorted to different degrees.

Meanwhile, the microcracks induced by the shock wave cause the material damage and the material damage accelerates the production and extension of the microcracks. Furthermore, the X-ray diffraction analysis shows that the impact can improve the crystallization of the material and there forms a metastable structure during the cooling process that can advances to some extent the impact toughness.

Keywords: [solid mechanics](#) [crystal structure](#) [plane shock](#) [Ti6Al4V alloy](#) [deformation](#) [crack](#)

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