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论文

铝合金液体金属脆断过程的TEM原位观察

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摘要： 采用自制的恒位移加载台，在透射电镜(TEM)中原位观察了7075铝合金吸附液体金属(Hg十3％Ga)后加载裂纹前方位错组态的变化以及脆性微裂纹的形核和扩展．结果表明：液体金属吸附后能促进位错的发射、增殖和运动；当吸附促进位错发射和运动达到临界状态时，脆性微裂纹就在原裂纹顶端或在无位错区中形核并解理扩展.

关键词： 7075铝合金 液体金属脆 位错发射 位错运动 TEM

IN SITU TEM OBSERVATION OF EMBRITTLEMENT OF ALUMINUM ALLOY BY LIQUID METAL

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Abstract: The liquid metal-induced embrittlement (LME) of 7075 aluminum alloy was investigated by using a special constant deflection device. The change in dislocation configuration ahead of a loaded crack tip for 7075 aluminum alloy before and after adsorping of Hg+3%Ga atoms, and the initiation of liquid metal-induced microcrack have been observed in TEM. The results showed that chemisorption of liquid metal atoms could facilitate dislocation emission,multiplication and motioll. When the chemisorption - facilitating dislocation emission and motionreach to a critical condition, a microcrack will initiate in dislocation free zone (DFZ) or at the crack tip, and propagate in cleavage mode.

Keywords: 7075 aluminum alloy liquid metal-induced embrittlement (LME) dislocation emission dislocation motion TEM

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