

研究论文

热轧钒微合金TRIP钢的微观组织和力学性能

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**摘要:** 对一种钒微合金TRIP钢进行了热轧试验, 并研究其微观组织特征及力学性能。结果表明, 将终轧温度控制在 $A_{e3}$ 附近, 热轧后的钒微合金TRIP钢具有由铁素体、粒状贝氏体和一定量残余奥氏体组成的复相组织。EBSD分析结果表明, 其中75%以上的铁素体晶粒尺寸在1--6  $\mu\text{m}$ ; 绝大多数晶界取向差角度位于 $29^{\circ}$ -- $60^{\circ}$ 。当终轧温度为 $830^{\circ}\text{C}$ 、终冷温度为 $650^{\circ}\text{C}$ 时, 实验钢的综合力学性能较为优异, 抗拉强度为1015 MPa, 延伸率为19.5%, 加工硬化指数为0.24。

**关键词:** 金属材料 钒微合金TRIP钢 力学性能 晶界取向差

Microstructure and Mechanical Properties of 980 MPa Grade Hot Rolled V-microalloyed TRIP Steel

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**Abstract:** The microstructural characteristics and mechanical properties of a V-microalloyed TRIP steel after hot rolling under laboratory conditions were investigated. The results show that multiphase microstructure with ferrite, granular bainite and retained austenite can be obtained if the finishing temperature is nearby  $A_{e3}$ . EBSD analyses show that 75% or more ferrite grain size is in the range of 1 - 6  $\mu\text{m}$ ; most of the misorientation angles between grains were in the range of  $29^{\circ}$  -  $60^{\circ}$ . When finishing rolling temperature was  $830^{\circ}\text{C}$  and final cooling temperature was  $650^{\circ}\text{C}$ , the steel have excellent mechanical properties, the tensile strength arrives at 1015MPa, the elongation rate is 19.5% and strain-hardening exponent is 0.24.

**Keywords:** metallic materials vanadium-containing TRIP steel mechanical properties boundaries with misorientation

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