

硅对CLAM钢微观结构和力学性能的影响

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摘要 文章研究了合金元素硅对CLAM钢的力学性能和微观结构的影响。实验表明, 在CLAM钢中添加0.2%的Si会使其屈服强度和抗拉强度明显提高, 同时使CLAM钢的韧脆转变温度升高, 韧性降低。在光学显微镜下观察, CLAM钢呈现回火马氏体组织, Si的添加使奥氏体晶粒细化, 致使CLAM钢的强度升高、韧性降低。在透射电子显微镜下观察, 回火板条马氏体是其主要结构, 存在针状和颗粒状两种形态的碳化物。利用透射电子显微镜选区衍射方法可知, 呈颗粒状的碳化物是M23C6型碳化物。Si的添加使马氏体板条的宽度变小。

关键词 [CLAM钢](#) [硅](#) [微观结构](#) [力学性能](#)

分类号

Effect of Silicon on Microstructure and Mechanical Property of China Low Activation Martensitic Steel

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Abstract The effect of silicon on microstructure and mechanical property of China low activation martensitic (CLAM) steel was investigated. The tensile strength increases and the DBTT is higher but the toughness decreases by adding 0.2% Si. The microstructure of CLAM steel appears as a tempered martensite by light optical microscopy (LOM). The prior austenite grain size is smaller in CLAM steel with 0.2% Si, which leads to the tensile strength increases and the toughness decreases. The tempered lath martensite is the primary microstructure feature by TEM. Two types of carbide are observed in CLAM steels. One is needle type and the other is grain type. The grain type carbide is identified as M23C6 carbide using selected area diffraction. The martensitic lath width is smaller in CLAM steel with 0.2% Si.

Key words [China](#) [low](#) [activation](#) [martensitic](#) [steel](#) [silicon](#) [microstructure](#) [mechanical](#) [property](#)

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