

عنوان مقاله:

Synthesis of Fe-TiC Hard Coating From Ilmenite via Laser Cladding

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خلاصه مقاله:

The aim of this work was to synthesize TiC reinforced coating on carbon steel via reduction of ilmenite powder. A mixture of ilmenite and graphite was pre-placed on AISI ۱۰۲۰ steel surface. The effect of the addition of excess graphite amounts on the progress of synthesis of carbide particles was studied. The evolution of phases in different coatings was analysed via X-ray diffraction and scanning electron microscopy. Then again, the initial powder mixtures were mechanically activated for various durations, to accelerate the reactions in transient melt pool. Finally, the Fe-TiC hard coating was successfully synthesized by carbothermic reduction of ilmenite through laser surface treatment. Moreover, it is proved that combination of mechanical activation with additive laser melting effectively improves the level of ilmenite reduction, besides enhancing the distribution of hard particles and the hardness of the coatings to more than ۱۳۰۰ HV.

کلمات کلیدی:

laser surface treatment, cladding, hard coating, TiC particles, carbothermic reduction

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