

## عنوان مقاله:

Investigation of the optimum ratio of raw material stoichiometry to produce Fe-TiC/Al<sub>2</sub>O<sub>3</sub> Composite

## محل انتشار:

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## خلاصه مقاله:

Ilmenite, aluminum and graphite can be used to produce in-situ Al<sub>2</sub>O<sub>3</sub>/TiC-Fe composites. Al<sub>2</sub>O<sub>3</sub>/TiC-Fe composites are used as cutting tools for machining gray cast iron and steels. Very few publications can be found in the literature that discuss the effect of molar ratio of aluminum and graphite in foresaid system. Therefore, the present research is designed to determine the effect of aluminum and graphite molar ratio in the raw materials. In addition, optimum ratio of raw material stoichiometry will be discussed here. In this research, the milled and pressed samples, from synthesized ilmenite, aluminum and graphite powder mixture with different molar ratios were prepared. Then, the samples were heat treated at 1300°C. The final products were analyzed with XRD and SEM. It was found that the optimum molar ratio of ilmenite, aluminum and graphite mixture is 1:2:1 which leads to the desired product of Al<sub>2</sub>O<sub>3</sub>/TiC-Fe composite. Increasing the amount of aluminum causes the TiAl<sub>3</sub> formation. Insufficient proportion of the aluminum also doesn't allow the reactions to be completed. In comparison with the optimum stoichiometry ratio of 1:2:1, using more graphite, leads to form the Fe-C compounds while less amount of graphite, causes incomplete reactions

## کلمات کلیدی:

Ilmenite, Aluminum and Graphite, Fe-TiC/Al<sub>2</sub>O<sub>3</sub> composites, molar ratio

## لینک ثابت مقاله در پایگاه سیویلیکا:

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