

عنوان مقاله:

Wear behavior of self-propagating high-temperature synthesized Cu-TiO₂ nanocomposites

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خلاصه مقاله:

In this paper, the copper-based nanocomposites with TiO₂ nanoparticles were synthesized by the self-propagating high-temperature synthesis (SHS) process. The effect of the different amounts of excess copper, in comparison with the stoichiometric ratio (CuO:Ti ratios of ۱:۱, ۲:۱, and ۳:۱), on the phase formation of achieved samples was studied. A thermodynamical study showed that increasing the excess copper powder reduces the adiabatic temperature, which helps the phase formation. The maximum Brinell hardness (۸۹) was obtained for the sample with the CuO:Ti ratio of ۱:۱. Finally, the wear behavior of the synthesized nanocomposites was evaluated by the pin on disk test, and the variation of friction coefficient and lost weight were measured. The friction coefficient decreased by the formation of phases and distribution of titanium oxide particles during the SHS process in the presence of the stoichiometric ratio of CuO:Ti. Therefore, the wear behavior was improved. The lowest depth of wear trace was measured ۰.۶۸ where the ratio of CuO: Ti was ۱:۱. © ۲۰۲۱

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