

## Densification Behaviors of Fe-TiC System during Spark Plasma Sintering

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### Abstract

The SPS process is a synthetic technique which makes sinter-bonding possible at a lower temperature in a shorter sintering time and then becomes finer grain size than conventional sintering methods.

Fe-TiC system is relatively light material one third of tungsten carbide and less than a half of tool steel in weight. And then it gives reasonable price of Fe-TiC system due to high mass effect with low density and relatively low cost of changing tools and bearings etc. Fe-TiC system can be machined easily by conventional equipment.

In the present work, SPS was conducted in the temperature range from 1000°C to 1150°C for 10min at constant heating rate and pressure. And then, physical properties and grain size after sintering were evaluated at various Fe contents.

## Sintering of MA956 Powder by SPS and Strengthening by Addition of W and Mo

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### Abstract

The sintering way of SPS and effect of W and Mo on the properties of MA956 was investigated. The powders become amorphous and grain size is less than 40 nm after MA in a planetary milling machine for 48h with a milling rate of 280r/min. When SPS sintering temperature is above 900°C, sintered compact density is above 99.1% and nearly full. And the alloy grain size is below 0.7μm. The addition of 3%wt W/Mo can increase pressure strength of room and 800°C, but its ductility decrease somewhat. Element W is better than Mo in improvement of high temperature relaxation behavior.