

ABSTRACT

This research was conducted to study the effect of alloying element on iron (Fe) based composites reinforced with silicon carbide (SiC) particles. Two alloying elements were added to the composite that is nickel (Ni) and cobalt (Co). 11 wt% of Ni were added and the composition of Co was varied from 0 to 25 wt%. The composite was fabricated via powder metallurgy (PM) method, which consists of mixing, compaction and sintering processes. The powder was mixed for 2 hours to obtain uniformity between alloying element and Fe/SiC and compacted to a cylindrical shape at 290 MPa. Samples were sintered for 2 hours at 900°C with 10°C/minute heating rate in argon atmosphere. The influences of alloying element on the sintered samples were characterized in terms of microstructure and hardness testing. Microstructure observation reveals well distribution of SiC particles in Fe matrix phase. However, the presence of alloying element is isolated at the matrix phases. The Fe-Ni/SiC composite with 25 wt% Co shows highest hardness value.

Keywords: Alloying element, Composite, Powder metallurgy