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EFFECTS OF NANO-SiC ADDITION ON THE SUPERCONDUCTING PROPERTIES OF MAGNESIUM DIBORIDE

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ABSTRACT
In this study, we report the results on phase formation, microstructures, and superconducting properties of a series of MgB2 samples with different level of SiC additions. The polycrystalline samples were prepared via solid state reaction by mixing magnesium, boron and silicone carbide powders according to the ratio of Mg:B:SiC = 1:2:*x*. XRD spectra showed that MgB_2 is the primary phase while Mg_2Si, MgO and MgB_4, together with some unreacted SiC are the secondary phases as the addition increases. The presence of Mg_2Si became more significant as the addition level increased. SEM images showed smaller grains as the addition level increases indicating more grain boundaries were formed. The Tc was as low as 30.5K for *x*=15wt%. The field dependence of Jc showed that *x*=1wt% sample gave the best performance at both 5K and 20K.

Keywords: MgB_2; MgO; MgB4; superconducting properties

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