

Thermal, Electrical, Mechanical Properties of Polydimethylsiloxane Composite Sheets Filled with Boron nitride, Alumina, and Graphite

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Abstract

The thermal conductivity of boron nitride(BN), alumina and graphite polydimethylsiloxane(PDMS)-matrix was studied. PDMS composites were fabricated using a twin-screw kneader, which made it possible to simultaneously control kneading, mixing, and heating. The thermal conductivity of these composites is shown to increase in accordance with the concentration of filler. Also, there is a tendency that the size of boron nitride particle larger the thermal conductivity of composite is higher. PDMS/BN, PDMS/Alumina composites has an electrically insulating surface unlike PDMS/Graphite.The resulting composite was characterized by Quick Thermal conductivity Meter (QTM-500), Scanning Electron Microscope (SEM) and electrical conductivity measurements. The mechanical properties which are tensile strength, curing, and hardness analyzed by Universal testing machine(UTM) and shore-A, Rubber Process Analyzer(RPA-2000).

References

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Figures

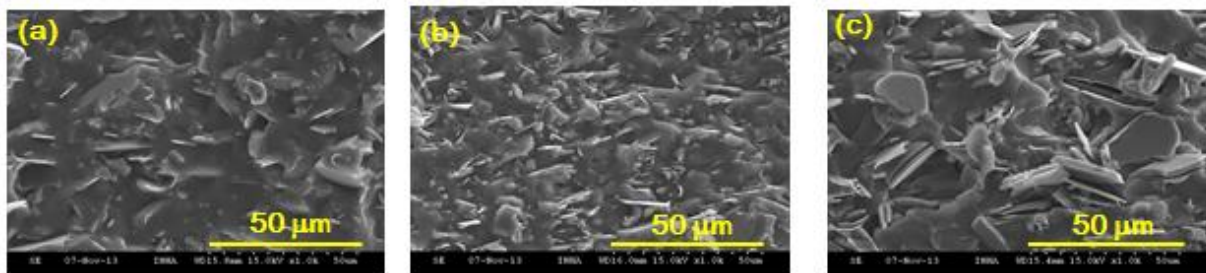


Fig. 1. SEM microphotographs of BN/PDMS (20 Vol.%) composite; (a) 5 μm , (b) 10 μm , (c) 20 μm