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ABSTRACT BOOK

Silicon Carbide Nanowires: Synthesis and Applications

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SiC nanowires produced by the self-propagating high-temperature synthesis (SHS) were isolated and used as the nanomass-sensing probe and reinforcing agent in nanocomposites. A single SiC nanowire was attached onto a support inside an electron microscope. It was possible to drive the SiC wire resonator, while imaging it and measuring the amplitude response. Thus, the resonance frequency and damping of the resonator could be measured. Research is currently underway whether this damping can be further reduced by thermal treatment. The SiC nanowires were also effectively used for epoxy resin/SiC and hybrid epoxy resin/liquid rubber (CTBN)/SiC nanocomposites. The effect of introduction of 1-D SiC on the morphology and properties of anhydride cured epoxy resin and epoxy/CTBN systems was investigated. SiC

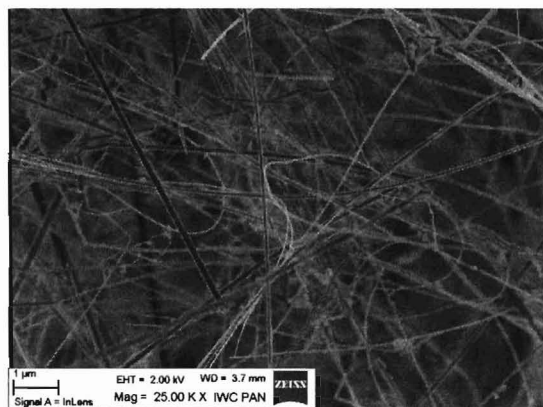


Figure 1: Typical SEM image for SiC nanowires grown from a powdered Si/PTFE mixture

nanowires were effectively dispersed in epoxy resin and epoxy resin/CTBN using both a high shear mixer and a tip sonicator. The nanocomposite morphologies were examined using SEM. Both the flexural modulus and the strength increased significantly with an addition of even a small amount of SiC nanofiber in epoxy resin systems.

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