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Microstructure Characterization on Silicon Carbide Formation from Natural Wood

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Abstract : Dark Red Meranti and Kapur, kinds of important type of wood in Malaysia were used as a precursor to fabricate porous silicon carbide. A carbon template is produced by pyrolysis at 850°C in an oxygen free atmosphere. The carbon template then further subjected to infiltration with silicon by silicon melt infiltration method. The infiltration process was carried out in tube furnace in argon flow at 1500°C, at two different holding time; 2 hours and 3 hours. Thermo gravimetric analysis was done to investigate the decomposition behavior of two species of plants. The resulting silicon carbide was characterized by XRD which was found the formation of silicon carbide and also excess silicon. The microstructure was characterized by scanning electron microscope (SEM) and the density was determined by the Archimedes method. An increase in holding time during infiltration will increased the density as well as formation of silicon carbide. Dark Red Meranti precursor is likely suitable for production of silicon carbide compared to Kapur.

Keywords : density, SEM, silicon carbide, XRD
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