

CdSe Nanoparticles Prepared in a Microspace

- A Controlled and Continuous Preparation of Monodispersed CdSe Nanoparticles -

Micro-space was utilized toward an industrial production of nano-particles. A microreactor, which is a reactor utilizing micro-space, can control reaction condition exactly and reproductively. CdSe was prepared by utilizing a microreactor, and good controllability and excellent reproducibility of particle diameter distribution was demonstrated. We are now trying to establish a method for narrower diameter distribution and also an industrial production of nanoparticles.



Fluorescence from nanoparticles of various diameters

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AIST Today Vol. 2, No. 6
(2002) 10

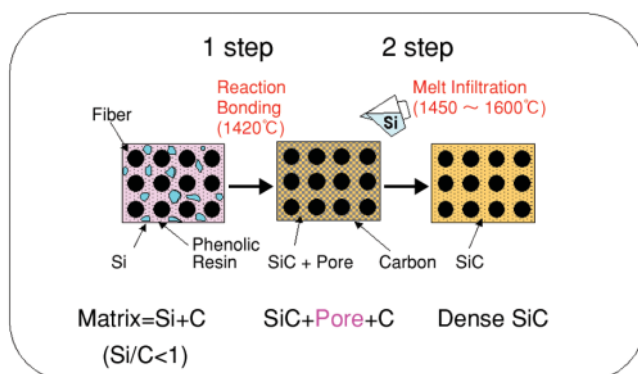
Mechanical Engineering and Manufacturing Technology

Ceramic Matrix Composites by Two-Step Reaction Bonding

Fiber reinforced SiC composites could be fabricated at 1420°C by reaction-bonding with carbon from silicon powder and phenolic resin as matrix precursor. However, this reaction caused ~38% volume reduction. On the other hand, liquid silicon infiltration into porous carbon matrix was generally used for SiC matrix composites.

This reaction between carbon in the preform and liquid Si from outside of the preform increases the volume of ~ 56%. Therefore, this preform needs appropriate porosity to complete this reaction. So we combined these reaction-bonding method and liquid silicon infiltration method to obtain dense SiC/SiC composites.

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AIST Today Vol. 2, No. 4
(2002) 17



Schematic illustration of 2-step reaction bonding method for SiC/SiC composites