Tohoku Univ. Technology

Fractal porous silicon carbide

Simple production of porous SiC with high porosity

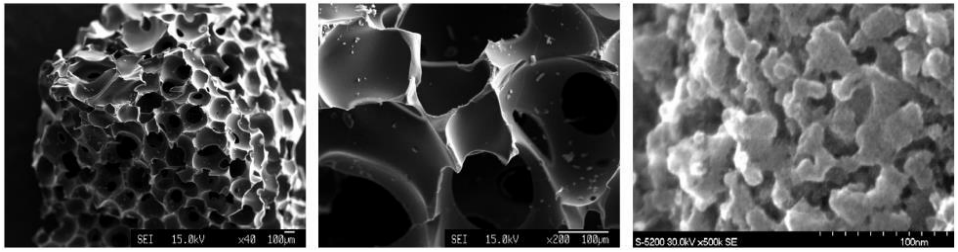
Overview

Porous body with nano to micro order small pores is expected to be used in many applications. Among materials that make up porous body, silicon carbide has attracted attention because of its high heat resistance temperature and excellent property as a semiconductor material. However, for the application of porous silicon carbide, it is necessary to consider not only the excellent property of silicon carbide, but also the structure of the porous material.

This invention is about a porous silicon carbide with porous structure having a wide range of pore sizes from nanoscale to millimeter scale and showing fractal nature, as well as its simple production method. The production method has the process of heating an organosilicon compound in metal vapor (such as Mg vapor) to form a composite of silicon carbide and metal oxide, and the process of eluting metal oxide from the composite. Porous silicon carbide produced by this method is suitable for application that requires a large surface area because of its high porosity.

Features･Outstandings

POSS powder → Mg vapor, 900-1,100 °C → **SiC/MgO composite** → HCl treatment, r.t., 2 days → **Porous SiC**



By zooming the particles with a microscope from left to right, fractal structure with size of particle diameter ≈ 1 mm (left), pore diameter ≈ 100 μm (middle), pore diameter ≈ 100 nm (right) can be observed.

Product Application

- ☐ Semiconductor material
- ☐ Heat resistant material
- ☐ Acid resistant material

IP Data

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