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Oxidation-Bonded SiC Membrane for Microfiltration Applications

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Porous SiC proved its validity in microfiltration membrane fabrication, but application is limited due to its high fabrication cost. In this study oxidation bonding technique was used to fabricate SiC microfiltration membrane at low temperature. The oxidation behavior at different thermal treatments was related with pore morphology and ultimately the membrane permeance. By coating the clay-bonded SiC support with oxidation-bonded SiC and sintering the coating at 1100 °C for 1 h, we prepared a defect-free microfiltration membrane with pure-water membrane permeance of $>210 \text{ l m}^{-2} \text{ h}^{-1} \text{ bar}^{-1}$, an average pore size of 93 nm, and a narrow pore-size distribution.

Keywords: SiC membrane; Oxidation-bonding; Microfiltration; Permeance; Dip coating