

Accepted Manuscript

Title: Low-temperature preparation of Si_3N_4 whiskers bonded/reinforced SiC porous ceramics *via* foam-gelcasting combined with catalytic nitridation

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PII: S0955-2219(17)30723-9
DOI: <https://doi.org/10.1016/j.jeurceramsoc.2017.10.043>
Reference: JECS 11530

To appear in: *Journal of the European Ceramic Society*

Received date: 27-7-2017
Revised date: 18-10-2017
Accepted date: 21-10-2017

Please cite this article as: Han Lei, Wang Junkai, Li Faliang, Wang Huifang, Deng Xiangong, Zhang Haijun, Zhang Shaowei. Low-temperature preparation of Si_3N_4 whiskers bonded/reinforced SiC porous ceramics *via* foam-gelcasting combined with catalytic nitridation. *Journal of The European Ceramic Society* <https://doi.org/10.1016/j.jeurceramsoc.2017.10.043>

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Low-temperature preparation of Si_3N_4 whiskers bonded/reinforced SiC porous ceramics via foam-gelcasting combined with catalytic nitridation

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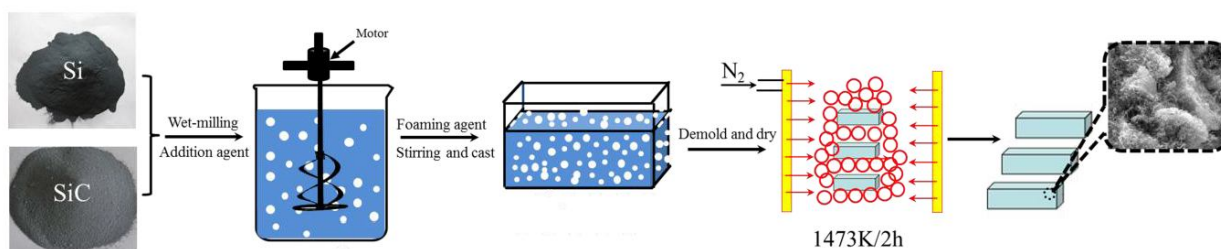
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Graphical abstract



Abstract

Porous α - Si_3N_4 whiskers bonded/reinforced SiC ($\text{Si}_3\text{N}_{4(w)}/\text{SiC}$) ceramics were successfully prepared at as low as 1473 K for 2 h, via a combined foam-gelcasting and catalytic nitridation route using commercial Si and SiC powders containing some Fe impurity as the main raw materials. Small pores (0.03~5 μm) left by the packing of raw material particles and interlocking of *in-situ* formed Si_3N_4 whiskers coexisted with large ones (8~400 μm) resultant mainly from the foaming process.

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