

International Advanced Research Centre for Powder Metallurgy & New Materials (ARCI)

Balapur P.O., Hyderabad – 500005, Telangana, India



Aqueous based gel casting process for the development of near net shape non-oxide ceramic product

Overview

Gel casting is a near net shape colloidal processing technique for ceramics which can be adapted to develop ceramic products having various size and shapes. This technique offers advantages of machining intricate shape ceramic parts in green condition. It is possible to tailor the properties of ceramics in terms of density, mechanical properties by tailoring the composition and processing parameters. ARCI has developed SiC, Si₃N₄ and SiAlON products in prototype scale with the help of gel casting process and successfully sintered the products without any warpage or defect.

Key Features

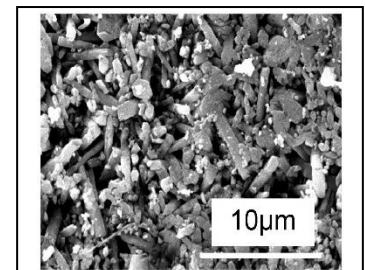
- Near-net processing of complex shapes.
- Green machining.
- Scalable to large size.
- Cost effective.



Green SiAlON crucible produced by gelcasting technique at ARCI

Potential Applications

- Non-oxide based crucibles for metallurgical industry.
- Electromagnetic windows.
- Cellular SiC product for solar receiver applications.



SEM micrographs of optimized SiAlON composition used in producing radomes prototype

Intellectual Property Development Indices (IPDI)

- Up-scaling is in progress for large size products.

Status	1	2	3	4	5	6	7	8	9	10

Major Publications

1. P. Barick, D.C. Jana and B.P. Saha, Load-dependent indentation behaviour of β -SiAlON and α - Silicon carbide, *J. Adv. Ceram.* 2, (2013), 185-192.

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