

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

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



Gel Casting of Complex Shaped Ceramics

Overview

Gel casting process involves solidification of ceramic slurries by the free radical initiated polymerization of a chain forming monomer with a cross linking monomer in presence of a catalyst. Specific advantages such as high solid loading (50-55 vol %), instant solidification (15-60 min) and uniform green microstructure enabling green machining. However, acrylamide based gel casting process suffers from the serious drawback of being toxic as a result of which its use on a wide spread commercial scale has been limited. In view of this an environmentally benign nontoxic polymeric such as methyl cellulose, which undergo thermally induced gelation at temperatures in the range of 70-80°C has also experimented for shaping.

Key Features

- Acrylamide based gelation through polymerisation process
- Environmental friendly methyl cellulose based thermal gelation
- Flexibility in polymer selection for the desired green strength
- Near net complex shaping
- Possibility of green machining of parts, if required



Digital photograph of gel cast sample

Potential Applications

- Shaping of near net shaped complex ceramic parts



Digital photograph of gel cast sample

Intellectual Property Development Indices (IPDI)

- Processing steps optimised
- Capability to produce complex shapes

Status	1	2	3	4	5	6	7	8	9	10
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