Ceramic tape preparation by filler controlled polymer pyrolysis

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Resumo:

Preparation of novel materials from inorganic polymers has attained particular interest in the last years, being one of the reasons to open the plastic shaping technology for the manufacturing process. The current work deals with preparation process of thin ceramic tapes applying the active filler controlled pyrolysis of poly(siloxanes) with different kinds of inert and active fillers (e.g. SiC, Al2O3 etc.) by the doctor blade method. The preparation of castable slurries and the tape casting process were carried out at room temperature. Cross linking of the polymer was also performed at room temperature using oleic acid as catalyst. After drying the tapes present sufficient flexibility for easy handling. Pyrolysis process was conducted in inert atmosphere (argon) up to 1500C. Phase and microstructure formation was investigated by X ray diffraction analysis and scanning electron microscopy, respectively. Porosity was measured by He pycnometry. It is shown, that pyrolysis of preceramic polymers is a suitable way for tape casting and this new method is compared to conventional methods of tape casting.