

عنوان مقاله:

Preparation of High-Solid Filled Alumina Inks for Stereolithography 3D Printing Process

محل انتشار:

مجله سرامیک های پیشرفته, دوره 7, شماره 2 (سال: 1400)

تعداد صفحات اصل مقاله: 5

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خلاصه مقاله:

In ceramic additive manufacturing, it is important to fabricate parts with high solid contents to guarantee defect-free sintered parts. In stereolithography, low viscosity and especially shear-thinning behavior of the ink are the key factors in producing ceramic-resin parts. Therefore, there should be a correlation between solid loading and viscosity. In this study, Alumina-glass inks were printed using bottom-up and top-down approaches, and the rheological properties were investigated. The main objective of this study was to print a highly filled ceramic-resin part with a viscosity suitable for DLP printing. While use of suspensions with low viscosity was recommended for top-down digital light processing (DLP) printing, a new setup was designed to study the feasibility of the top-down approach for pastes for the top-down approach. According to the findings, ceramic-resin pastes with the solid content of maximum 75 wt% and viscosity of 47.64 Pa.s at the shear rate of 30 s⁻¹ were easily printable via our hand-made top-down DLP printer. However, it was not possible to print inks with solid contents more than 60 wt% using the bottom-up DLP, mainly because the detachment force grew dramatically with an increase in viscosity.

کلمات کلیدی:

Additive Manufacturing, 3D Printing, DLP, Alumina, Rheology

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