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RESEARCH HIGHLIGHTS

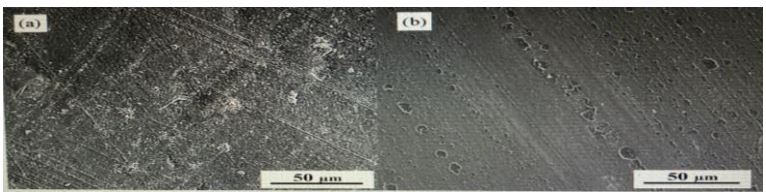
1. Bioactive Glass for Bone Scaffolding

One of the major work on the bioactive glass synthesis via sol-gel approach is the inclusion of nanomaterial into the formulation for a production of highly intercalated and porous glass material. The synthesis process can be easily tailored, and the synthesis temperature is quite low as well. The produced glass shows a promising reaction, *i.e.,* good formation of hydroxyapatite when immersed in simulated body fluid.

M. Sarmast Sh, S. George, A.B. Dayang Radiah, D. Hoey, N. Abdullah, S. Kamarudin. Synthesis of bioactive glass using cellulose nano fibre template. Journal of the Mechanical Behavior of Biomedical Materials, Volume 130, 2022, 105174,

2. Phenol Formaldehyde Resole Resin with Plant-based Tannin

This work focuses on the safe inherent design of materials by reducing the consumption of hazardous chemical and substituting it with a more environmentally friendly material. Hence, dissolved tannin was used to minimize the use of phenol and formaldehyde in the resole resin synthesis. However, the utilization of tannin powder in the preparation of resole resin is quite challenging due to the low dissolution rate of tannin in the liquid formulation. There are various challenges addressed in the study including the dissolution behavior of tannin in the selected solvent, the runaway reaction that occurred due to slow heat dissipation process and high latent heat released, and sudden viscosity changes that degrade the quality and pliability of the polymer. The resole resin was designed for laminate applications.



Cured Tannin Phenol Formaldehyde resin

Cured Dissolved Tannin Phenol Formaldehyde resin

N. Kamarudin, D. R. A. Biak, Z. Z. Abidin, F. Cardona and S. M. Sapuan, "Rheological study of phenol formaldehyde resole resin synthesized for laminate application", *Materials (Basel).*, vol. 13, no. 11, pp. 14-19, 2020.