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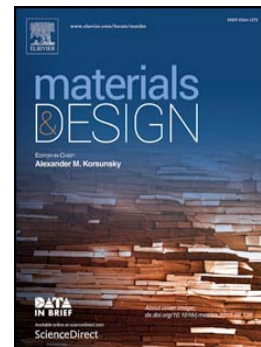
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New biobased foams from wood byproducts

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Abstract :

Macroporous polymeric materials were prepared using mixtures of polyphenol : hydrolysable tannins, condensed tannins and lignosulfonate, from pulp industry, as the main raw source. The process used is simple, green and low energy consuming. It consists of a mechanical foaming of aqueous solutions constituted with different proportions of two types of tannins, the lignosulfonate and a hardener in the presence of a surfactant, which maintain the mixture stable before curing.

The final formulations, with tannins and lignin were characterized by Scanning Electronic Microscopy, mercury intrusion porosimetry, nitrogen sorption, mechanical and thermal measurements. Then, to determine whether the components react with hexamine but also between them, mixtures were made, first with one polyphenol at a time and then with polyphenols in pairs. Those formulations were characterized through thermal and mechanical properties.

Solid, self-standing foams with an average porosity of 89%, an average cell diameter of 105 m with interconnections of about 7 m were obtained. The structure of the foams is close to that of phenolic, tannin, lignin and biobased polyurethanes foams already reported in the literature. Concerning mechanical properties, compression modulus between 0.65 MPa and 22.9 MPa were obtained. The thermal conductivity varies between 0,035 and 0,055 W. m⁻¹.K⁻¹.

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