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Evaluation of the incorporation processes of lignin in nitrile rubber compositions

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The search for sustainable materials with economic viability has been driving the development of solutions utilizing natural and renewable resources for various technological applications. For instance, in the rubber industry, a way to incorporate sustainability into their products by using renewable and biodegradable raw materials in their formulations. In this context, lignin, the Earth's second-most abundant biopolymer after cellulose, emerges as a promising alternative to replace carbon black due to its availability, biodegradability, high mechanical properties, low density, and low cost. This study aims to investigate whether the incorporation process of lignin impacts its interaction with nitrile rubbers, potentially providing a technical advantage in the properties of the resulting composites. For that, masterbatches of nitrile rubber and carboxylated nitrile rubber with lignin in a theoretical amount of 130 phr were produced by the coagulation of the respective latices and an aqueous-lignin suspension (34% wt). The study is currently focused on characterizing the masterbatches to prepare the rubber compositions.