

Shear and extensional rheology of galactomannans extracted from seeds of *Gleditsia triacanthos* and *Sophora japonica*: comparison with guar gum and locust bean gum

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Galactomannans such as guar and locust bean gums are extensively applied in the food industry as thickening and stabilizing agents, due to their low cost and wide range of functional properties, but there is a demand for alternative sources of seed gums to e.g. modify the rheological characteristics, texture and appearance of food products. In this work, two non-conventional galactomannans were isolated from *Gleditsia triacanthos* and *Sophora japonica* seeds, and their rheological behaviour, in steady and dynamic shear conditions and in extensional conditions (using a capillary breakup extensional rheometer), was determined and compared to those of guar gum and locust bean gum, in order to investigate their effectiveness as alternative thickening hydrocolloids. The studied galactomannans displayed a shear-thinning behavior and the solutions of *Sophora japonica* galactomannan exhibited the highest viscosities followed by *Gleditsia triacanthos* galactomannan, guar gum and locust bean gum solutions (for example, at low shear rates and 1 % of gum, the obtained values were 486.7 Pa.s, 67.8 Pa.s, 67.3 Pa.s and 24.1 Pa.s, respectively). Experimental data in steady shear have been correlated with Cross and Carreau models and both models described the viscosity shear rate data satisfactorily ($R^2 > 0.90$). The extensional rheology showed that break-up time, relaxation time and elastic module decreased with the decrease of polymer concentration and with the temperature rise. The higher values of these parameters were obtained for the *Sophora japonica* galactomannan and are in agreement with shear rheology results. These results will contribute to the research of novel renewable sources of hydrocolloids, as alternatives to the traditional ones, and to the development of novel foods, addressing the claims of the modern consumer.