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Editorial

Editorial for Special Issue "Advances in Experimental and Computational Rheology"

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Rheology, defined as the science of deformation and flow of matter, is a multidisciplinary scientific field, covering both fundamental and applied approaches. The study of rheology includes both experimental and computational methods, which are not mutually exclusive. Its practical importance embraces many processes, from daily life, like preparing mayonnaise, spreading an ointment, or shampooing, to industrial processes like polymer processing and oil extraction, among several others. Practical applications include also formulation and product development.

The special issue "Advances in Experimental and Computational Rheology" joins fifteen works covering some of the latest advances in the fields of experimental and computational rheology applied to a diverse class of materials and processes, which can be grouped into four main topics: rheology [1–5], effect of process variables [6–9], rheometry and processing [10,11], and theoretical modeling [12–15]

The characterization of rheological behavior is the main topic of five contributions, covering the following material systems: lubricating greases (Delgado et al. [1]), Carbopol® dispersion in water and in water/glycerol solutions (Varges et al. [2]), natural hydraulic lime grouts (Baltazar et al. [3]), fresh cement pastes (Rubio-Hernández [4]), and legume-protein-stabilized emulsions (Félix et al. [5]).

The effect of process variables is covered in four papers. Kurz et al. [6] studied the droplet formation of Newtonian fluids and suspensions modified by spherical, non-colloidal particles. Fernandez et al. [7] investigated the effect of different irradiations/mixing on the rheology and electrical conductivity of PP/MWCNT nanocomposites. García et al. [8] evaluated the effect of temperature on the rheology of diutan and rhamsan gum aqueous solutions. Trujillo-Cayado et al. [9] described the effect of homogenization pressure on the rheological behavior of biopolymer-stabilized emulsions formulated with thyme oil.

Two of the special issue works are dedicated to rheometry and processing. Costa et al. [10] assessed the employment of piezoelectric sensors on the acquisition of steady melt pressures in polymer extrusion, and Costanzo et al. [11] evaluated the possibility of performing the linear and non-linear rheological characterization of samples with just a few milligrams.

Theoretical modeling is the main topic of the four remaining works. Fadoul and Coussot [12] proposed and performed a set of experiments to assess a theoretical model developed to predict the flow Saffman–Taylor instability in yield stress fluids. García-Sandoval et al. [13] studied the capability of the Bautista–Manero–Puig model to predict shear banding in polymer-like micellar solutions. Furtak-Cole and Telyakovskiy [14] resorted to 3D modelling techniques to assess the applicability of a simple 1D model for the flow in aquifers and fissures. Green et al. [15] proposed modifications of a previously developed constitutive model for shear thickening colloidal solutions, which explicitly accounts for the evolution of its microstructure during flow, and assessed its accuracy.

Finally, it is very important to recognize and acknowledge the effort put forth by the large number of anonymous reviewers, which has been essential to assuring the high quality of all the contributions of this special issue.

Conflicts of Interest: The authors declare no conflict of interest.

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