RHEOLOGICAL PREDICTION OF SENSORY ATTRIBUTES FOR LOTIONS – LEARNING FROM TOOTHPASTES

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Lotions and toothpastes are rheologically similar in that most of them are thixotropic yield stress materials, semi-solid under static conditions, but flowing when shaken or agitated . Some of their relevant sensory attributes are also similar although methods of their assessment are somewhat different. This presentation demonstrates what formulators of these seemingly different products may learn from each other. To this end, complex rheological behavior of commercial lotions from European and Latin American markets were investigated and compared to panelist assessment of their sensory attributes. Similar studies were performed on some commercial as well as prototype toothpastes. Various rheological procedures, such as stress ramps, creep-recovery, stepped-shear rates, dynamic oscillatory strain sweeps and extensional viscosity measurements are discussed in this presentation. Tribological measurements and some visualization techniques on custom-built instruments are also discussed. The main goal of this work was to identify correlations between such laboratory measurements and consumer perceived properties of these products. For toothpastes, squeezability, shape retention and stringiness are the main sensory properties of interest and can be successfully predicted based on rheological measurements. For lotions, the variety of sensory attributes is much wider, although shape retention and stringiness are also relevant and can be assessed by similar methods. In addition to that, it is shown that firmness, peaking, wetness and oiliness of lotions correlate with yield stress and instantaneous viscosity. For toothpaste, rheological analysis allowed to establish basic structure-property relationships and optimize many formulations in terms of their main structure-forming elements, i.e., optimization can occur through adjusting levels of polymers, thickeners and abrasives. For lotions, similar analysis is possible although appears to be more complicated due to larger variability of formulas.