A New Implementation of the Torsional Crystal Viscometer

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Viscometry by torsionally vibrating piezoelectric quartz rods has been the only technique for absolute viscosity measurements on a routine basis. Growing needs for viscosity standards at elevated pressures and temperatures can be effectively addressed by torsional crystal viscometers without the need of calibration with reference materials. Deploying standard reference measurement methods to customers instead of standard reference materials is a new metrology priority at NIST. This talk will describe a new implementation of a torsional crystal viscosity sensor for easier assembly and thus broader usability, for higher accuracy, for an extended viscosity range, and for additional characterization of the dielectric properties of the sample fluid. This will enable the technique for measurements of species such as polar liquids and possibly electrolytes that could not be measured with this method before. Performance validation results of the sensor will be presented as they will be acquired up to the Symposium.