

Abstract Submitted
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Tuning Fork Oscillators as Downhole Viscometers in Oilfield Applications MIGUEL GONZALEZ, GREG BERNERO, OLIVERIO ALVAREZ, GREGORY HAM, DEFFENBAUGH MAX, Aramco Services Company: Aramco Research Center - Houston, SENSORS DEVELOPMENT TEAM — The commerciality of oil wells is greatly influenced by the physical properties of the fluids being produced. A key parameter in determining how producible the hydrocarbons are is their viscosity. Pressure and temperature changes in recovering a downhole sample to the surface can alter viscosity while accurate downhole measurement of this critical property remains a rudimentary effort in the industry. In this presentation we describe the challenges of measuring and quantifying the viscosity of reservoir fluids in situ at downhole conditions, as well as present an overview of some of the different measurement techniques currently used. Additionally, we show our characterization of a piezoelectric tuning fork oscillator used as a viscosity sensor. In an attempt to recreate the environment found in oil wells, its mechanical and electrical properties were studied while the device was immersed in different fluids and, separately, under different conditions of pressure and temperature. This device is a first step toward the development of an inexpensive, integrated, and miniaturized sensing platform for the in situ characterization of reservoir fluids.

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