

Solution Mining Research Institute Spring 2016 Technical Conference
Galveston, Texas, USA, 25 – 26 April 2016

ELASTIC PROPERTIES OF SALT: ULTRASONIC LAB MEASUREMENTS AND LOG ANALYSIS IN THE GULF OF MEXICO AREA

Jingjing Zong, Robert R. Stewart, Nikolay Dyaur, and Michael T. Myers
University of Houston, Houston, Texas, United States

Abstract

We use lab measurements and well-log data to determine the properties of salt crystal and rocks. In the lab, we have undertaken ultrasonic measurements on salt samples from various locations. The samples from the Hockley and the Bayou salt mine have P -wave velocity from 4.02 to 4.76 km/s (13.19 – 15.62 ft/s), and S -wave velocity from 2.42 to 2.92 km/s (7.94 – 9.58 ft/s). The density ranges from 2.16 - 2.22 g/cm³. The pure halite crystals from the Goderich salt mine, Canada, demonstrate shear-wave splitting and indicate cubic anisotropy.

From a study of 142 log suites of boreholes drilled through salt in Gulf of Mexico coast, we notice a trend of P -wave velocities increase with depth: $D(\text{km}): V_p = 4.41 + 0.0145D$. This relationship and its variation (0.1 km/s) can provide a velocity model. For salt density, our electron density readings concentrate around 2.06 ± 0.1 g/cm³. All of these measurements can assist in understanding salt properties and seismic velocity model building.

Key words: Geophysics, Gulf Coast of the U.S. and Mexico, Salt Domes, Salt Properties, Well Logging

©2022 – Solution Mining Institute

Full Paper is Available in the SMRI Library(www.solutionmining.org)