

Abstract Submitted
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Positron Doppler Broadening Study of Clays and Shale Samples

FNU AMEENA, HAYDEN MORGAN, C.A. QUARLES, Texas Christian University — A previous detailed positron spectroscopy study of well-characterized reservoir rocks (carbonates and sandstones) has demonstrated the usefulness of positron Doppler Broadening spectroscopy in characterizing rocks [1]. The commonly measured S and W parameter were shown to be reproducible bulk properties of the rocks. A follow-up study has been undertaken to investigate clay and shale samples. While clay and shale are more complex and more heterogeneous than the reservoir rocks, it is believed that positron lifetime and Doppler broadening spectroscopy can help to characterize and distinguish the various samples and perhaps provide new useful insights into these materials. An overview of the Doppler broadening spectroscopy results will be presented and discussed for five well defined clay standards, (Na and Ca Montmorillonite, Smectite and Kaolin) and a variety of shale samples, which typically consist of mixtures of carbonate, silica and clay as well as organic carbon. The results include the usual S and W parameters as well as momentum distribution ratios of samples to standards such as Si and SiO₂.

[1] J.M. Urban-Klaehn and C. A. Quarles, Journal of Applied Physics 86 (1999)355.

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