New Insights into the Mineralogy and Organic Content of the Tuscaloosa Marine Shale

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Abstract

The Tuscaloosa Marine Shale (TMS) is an emerging shale play in southeast Louisiana and southern Mississippi with an estimated 7 billion barrels of potentially recoverable oil. To date there have been a limited number of discrete samples analyzed in the laboratory to define the properties of TMS rocks. These limited and highly-variable mineralogical and geochemical results have led to a great deal of speculation regarding the significance of the TMS play. Additional data are needed to form a more complete picture of the TMS and to identify which regions are likely to be the most productive and suitable for drilling. Here we present new mineralogical and geochemical data from 7 wells in the TMS and integrate these finding with previous work from our group that reported data from 11 TMS wells. Samples from cuttings were collected from the horizontal sections of 7 wells in Wilkinson and Amite counties in Mississippi and East Feliciana, St. Helena, Tangipahoa, and Washington Parishes in Louisiana. Fifty-seven samples from the 7 wells were analyzed using XRD and Rock Eval instruments at the University of Louisiana at Lafayette. TOC values (in weight %) for these wells averaged 2.92% (± 0.44% 1 SD), which is meaningfully higher than the average TOC of 1.65% (± 0.6% 1 SD; n = 136) for 11 TMS wells recently reported by our research group. Much of the TOC appears to be type II, oil prone kerogen. The concentration of quartz in the newly-analyzed samples averaged 31.7% (± 3.9% 1 SD), while previously reported concentrations were measurably lower (22.8% ± 6.6%; n = 161). The average concentration of calcite in the newly-analyzed samples (15.5% ± 4.6% 1 SD) was roughly the same as previous estimates while the total clay content was about 10% lower than previous estimates. These results show that the horizontal target region tested in the 7 wells

reported here is richer in organic matter and type II kerogen than previously speculated. We have integrated the new data with previous results to identify the regions in the TMS that may be the most productive based on physical and geochemical data. Ongoing work is examining how these regions compare to historical well completion and production data.