

Preliminary Source Rock Evaluation of the Lower Cenozoic Toledo Formation, Belize Basin, Southern Belize

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Abstract

formation crops out in the Toledo District of southern Belize along the newly cut Mile 14 highway. These outcropping strata in the southern Belize Basin have organic-rich beds that were analyzed for their hydrocarbon source potential. The Toledo formation is up to 3000 m thick in the basin and consists of submarine fan deposits composed of interbedded calcareous sandstones and mudstones with up to 45% calcite content, some pebbly conglomerates, and sparse detrital carbonate beds, but only a few hundred meters of this formation is exposed in the study area.

Thirteen outcrop samples of the Toledo formation with visible organic matter were analyzed using Leco carbon analysis and rock pyrolysis. Total organic carbon (TOC) values ranged from 0.26 to 1.86 wt% (avg. = 0.85 wt%) and hydrogen index values (HI) from 4 to 77 mg HC/g TOC. The TOC is mostly type IV kerogen from terrigenous woody plants and is gas prone. Tmax values in the six samples where they could be measured at all ranged from 430 to 439°C, indicating they are immature to early mature for hydrocarbon generation. Unpublished geochemical results from cuttings in wells drilled in southern Belize reveal similar consistently low TOC values. Although our data set of selected samples is small and our results are preliminary, they contribute new information on the petroleum geochemistry of the Paleogene section in the Belize Basin.

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