

Comparison between reflectance equivalent from estimated vitrinite and Tmax, Macasty Shale Oil, Anticosti Island, Quebec, Canada

Rudolf Bertrand, D. Sc., INRS-ETE, Quebec City
geomod2006@hotmail.com

Stephanie Roy, Ph.D., P. Geo., Petroliia, Quebec City
sroy@petroliagaz.com

Bernard Granger, Chief Geologist, M.Sc., P. Geo., Petroliia, Quebec City
bgranger@petroliagaz.com

Abstract

The Anticosti Island is situated in the northern part of the Gulf of St Lawrence and is part of the more extensive Anticosti Basin. The island is about 225 km in length and is approximately 50 km is widest part. The Early Ordovician to Early Silurian Anticosti Basin succession consists of a siliciclastic assemblage bounded by two carbonate assemblages. This is a wedge shape assemblage regionally thickening to the south-southwest and gently dipping to the south. The Anticosti sequence is poor in organic matter with the exception of the Macasty Formation, (Utica equivalent) which is an excellent oil prone (Type II) mature source rock. Only 19 wells and 6 slim holes have been drilled on the island.

A geochemical study has been realized to characterize the source rock potential of the Macasty and the thermal maturation of the post-Trenton sedimentary sequences. Fourteen wells and 3 slim holes were analyzed by Rock Eval pyrolysis (about 900 samples) and for the reflectance (more than 200 samples).

The reflectance of organic matter (R_o) was measured on randomly oriented organic particles under non-polarized, reflected light. The R_o of zooclastes (graptolites, chitinozoans and scolecodonts) and solid bitumen was converted into R_o vitrinite-equivalent (R_o -evi). Preliminary results indicate that the Macasty Formation is generally in the oil window except in the central southern part of the island.

The R_o -evi results were compared to the Tmax results. In some cases, reflectance vitrinite-equivalent results show higher thermal maturity when compare with thermal maturation from Tmax. This might be explained by the type of organic matter but also by the fact that Tmax is affected by the rock types.