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2010

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Recommended citation
Snowdon, L.R., Obermajer, M. and Issler, D.R., 2010. Rock-Eval/TOC data for thirty wells from Beaufort-Mackenzie Basin, Northwest Territories; Geological Survey of Canada, Open File 6682, 1 CD-Rom.

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INTRODUCTION

Cuttings samples with various spacing intervals have been analyzed using a Rock-Eval/TOC pyrolysis apparatus over the depth intervals noted below for 30 wells from Beaufort-Mackenzie region. Wet drill cuttings samples were sealed in cans at the well site and shipped to the Calgary laboratory of the GSC. The samples were washed to remove drilling mud and other obvious contaminants and then air dried at <40 ºC. An attempt was made to obtain a representative aliquot by selecting a random sample of several grams of the dried sample and then pulverizing this material either in a stainless steel mill or by hand using a mortar and pestle to ensure thorough mixing.

Well name and location	**Depth Range**		
Esso Home et al Atertak L-31 (K-31)	40	3130	m
Gulf Mobil Atigi G-04	4600	11910	ft
SOBC Cdn Sup et al North Ellice J-23	595	1995	m
Chevron Canada Pex et al Fish River B-60	7990	11440	ft
Gulf Mobil Ikhil I-37	9900	13600	ft
Esso Chevron et al Isserk I-15	60	2693	m
Esso PCI et al Itkrilek B-52	30	1280	m
Dome Hunt Kenalooak I-94	3490	4650	m
Shell Kipnik O-20	840	9800	ft
Imperial Delta 5 Kurk M-39	120	10200	ft
Imperial Langley E-29	150	12480	ft
Esso PCI Home et al Minuk I-53	30	3370	m
Esso Home PCI et al Nipterk L-19	50	3875	m
Esso et al Nipterk P-32	50	2130	m
Gulf Mobil Ogruknang M-31	9300	13600	ft
Gulf Mobil Dome Red Fox P-21	9300	13690	ft
Gulf Imp Shell Reindeer A-41	3510	6000	ft
B.A. Shell IOE Reindeer D-27	10100	12660	ft
Gulf Imp Shell Reindeer C-36	4600	6000	ft
Pacific Imp et al Roland Bay YT L-41	2198	8468	ft
Gulf et al Shak D-50	30	2010	m
Gulf Mobil Siku C-55	9010	14785	ft

Gulf PCI Home et al Tarsiut N-44	230	4500	m
Esso PCI Home et al Tuk E-20	250	2360	m
IOE Tuk F-18	7550	10310	ft
Gulf Imp Shell Tununuk F-30	7890	11930	ft
IOE B.A. Shell Tununuk K-10	6290	12326	ft
Shell Unipkat B-12	20	1180	m
Shell Unipkat N-12	30	1620	m
Imperial Wagnark G-12	5000	8400	ft

Depth units used (feet or metres) are those in which the original well was drilled and logged, and in which the samples are currently labelled. Formation names and depths listed at the end of each well are those obtained from the files of the Northwest Territories Geoscience Office (NTGO) at the time of analyses (prior to 2000). These stratigraphic tops, which are also used in the GSC-Calgary SAMS database, are in most cases likely the tops provided by the original operators of these wells. In this open file, no attempt has been made to review the stratigraphy. As most of these wells were drilled several decades ago, before the stratigraphy in this area was reviewed, some terms are no longer in current use and some of the tops may be incorrect, and hence misleading. Therefore, the stratigraphic data should be treated with caution.

EXPERIMENTAL

Rock-Eval/TOC analysis provides fast and reliable characterization of the quantity and quality of sedimentary organic matter, as well as its level of thermal maturity. The pyrolysis experiments were conducted using a Delsi Rock-Eval II instrument equipped with a TOC (total organic carbon) module, similar to the previously published results from this region (Snowdon, 1988, 1990a, 1990b).

A typical Rock-Eval experiment was initiated with heating of a pulverized rock sample at 300 ºC for 3 min in helium atmosphere, when naturally occurring hydrocarbons (free and adsorbed) are volatilized. During the next stage, the oven temperature is steadily increased to 600 ºC at a rate of 25 ºC/min and decomposition of kerogen occurs. The final stage involves oxidation and combustion of the residual organic matter at 600 ºC. The amount of hydrocarbons volatilized at 300ºC and evolved from kerogen at 300 ºC to 600 ºC is quantitatively determined by a flame ionization detector, and recorded as the S1 and S2 peaks, respectively. The temperature measured at the maximum of the S2 peak is referred to as Tmax. The quantity of organic CO_2 generated from 300 ºC to 390 ºC, determined by a thermal conductivity detector, comprises the S3 peak. The percentage of carbon in CO_2 formed

during oxidation at 600 ºC and in the hydrocarbon peaks S1 and S2 is used to define the total organic carbon content (TOC), expressed as a weight percentage. The determination of the quality of organic matter is based upon the calculation of Hydrogen (HI) and Oxygen (OI) indices (HI=S2/TOCx100, OI=S3/TOCx100) which are related to the atomic H/C and O/C ratios (Espitalié et al., 1977). The OI versus HI cross plots ("pseudo van Krevelen diagrams") can be used as an organic matter type indicator at low and moderate maturities. The Tmax is an indicator of relative thermal maturity. According to Espitalié et al. (1985) the oil window is defined by the following Tmax ranges: 440–448 ºC (Type I), 430–455 ºC (Type II) and 430–470 ºC (Type III). A cross plot of Tmax versus HI is used to constrain estimations of organic matter type and its thermal maturity, whereas the Production Index (PI=S1/[S1+S2]) is used to indicate staining of a sample or as an additional maturity parameter.

Interpretation of the results must be carried out with care (Peters, 1986). If TOC is very low (e.g. <0.1%) then all parameters have questionable significance and the experiment suggests no source rock potential. Similarly, if S1 and S2 are low (e.g. <0.2 mg HC/g rock), the analytical error may be large relative to the absolute measured value and the Production Index (PI = S1/[S1+S2]) ratio may be effectively undefined. Also it will be difficult to select a reliable peak top for a very low S2 value and thus the Tmax will be unreliable.

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