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Organic geochemical data from Northern Canada, part I: gasoline range and saturate fraction gas chromatograms of selected crude oils from Beaufort-Mackenzie region, offshore Yukon and Northwest Territories

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Publications in this series have not been edited; they are released as submitted by the author.

Introduction

This Open File contains digital data of gasoline range and C15+ saturate fraction gas chromatograms of 190 crude oil samples obtained from wells drilled in the Beaufort-Mackenzie region of Northern Canada. The gas chromatograms are stored in *.pdf (portable document file) format. All analytical work was done at the Organic Geochemistry Laboratory at the Calgary Office of the Geological Survey of Canada. The significance of the data is not discussed in this report.

Experimental

Preparation of crude oils

About 30-45 ml of oil were poured into a tared flask, boiling chips were added and the oil was heated up to 210°C. The fraction boiling below 210°C was distilled into a separate flask and weighed. The remaining fraction was cooled and weighed. About 4-5 grams of the fraction boiling above 210°C was deasphaltened by adding an excess of pentane (40 volumes). About 100 milligrams of each deasphaltened oil were then fractionated using column chromatography.

Analysis of gasoline fraction hydrocarbons

The gasoline range hydrocarbons (iC5-nC8) were analysed on a HP5890 Gas Chromatograph connected to an OI Analytical 4560 Purge-and-Trap Sample Concentrator. A small amount of the whole crude oil was mixed with deactivated alumina and transferred to the Sample Concentrator which was fitted with a tenax/silica gel/charcoal trap (OI trap #9). This was connected to a split/splitless injector on the Gas Chromatograph which was equipped with a 60m x 0.32 mm x 1.0 μm DB-1 column. Most samples were analyzed using the following temperature program: initial hold at 30°C for 10 minutes and then programmed to 40°C at a rate of 1°C/min, final temperature held for 25 minutes resulting in 45 min total run time. Some samples were analyzed using longer 55 min temperature program and consequently there are some variations in retention times between different samples. The eluting hydrocarbons were detected using a flame ionization detector (FID).

Liquid chromatography

A mixture of 28-200 mesh Silica Gel (MCB) and 80-200 mesh alumina (ALCOA) (1/3:2/3 by weight respectively) was used as a support for the column. The support was activated by heating at 120°-150°C for 12 hours. A glass wool plug was placed at the bottom of the column and covered with a 1 cm thick layer of sand. The support, weighed as 1 g of support/10 mg of deasphaltened sample, was slowly settled in pentane and any air trapped was released by gentle tapping on the column. Each deasphaltened sample, dissolved in a minimal amount of previously measured

pentane, was then added to a prepared column. Saturates were recovered by eluting with pentane (3.5 ml/g support), aromatics with a 50:50 mixture of pentane and dichloromethane (4 ml/g support), resins with methanol (4 ml/g support) and any remaining asphaltenes with chloroform. The solvents were rotary-evaporated, separate fractions transferred to tared 1 dram vials, dried in a slow stream of nitrogen and weighed to constant weight.

Gas chromatography

Saturate fractions were analysed using gas chromatography (GC). A Varian 3700 FID gas chromatograph was used with 30m x 0.25 mm x 0.25 μm DB-1 column with helium as the carrier gas. The temperature program was 60^{o}C to 300^{o}C at a rate of 6^{o}C/min and then isothermal for 30 min. The eluting compounds were detected using a flame ionization detector and, where possible, peak heights and areas were determined.