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## Neutron Backscatter Technique as an Alternative Method for Quality Assurance and Standardization of Petroleum Products

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Crude cost is one of the most important parameters in the operation of an oil company. The choice of crude is very vital in that it determines the profit margins of oil companies, hence the selection of an optimum crude for processing requires a lot of consideration. Neutron backscatter technique is a non-destructive method used for industrial investigation, including determination of hydrogen content of crude and its finished product. This method has a wide scope of application and is faster in comparison with the chemical methods employed by the petroleum industries which are destructive, product specific and often requires several hours of heating samples at temperatures up to 75 0°C to obtain results.

Neutron backscatter technique was used in this work to determine the total hydrogen contents of petroleum samples from Tema Oil Refinery (TOR) and crude oil samples from the Jubilee oil field in Ghana and Bonny light and Forcados oil fields in Nigeria. Excess neutron counts were measured and reflection parameters determined as a function of hydrogen content of the samples. Liquid hydrocarbons of known hydrogen and carbon contents were used as standards to draw calibration curves against which the total hydrogen contents of the samples were determined.

The total hydrogen contents were found to be in the range of 7.21(hw %) - 15.06 (hw %) for vertical geometry and 7.20 (hw %) - 14.94 (hw %) for horizontal geometry respectively. The results obtained agreed well with other results obtained using different methodologies. The results shows a high hydrogen content in both Nigeria's bonny light and Ghana's Jubilee crude oil samples however, in Nigeria's Forcados crude oil sample there was a low hydrogen content. This confirms that neutron backscatter technique is able to distinguish between light sweet crude and heavy sour crude.

### Country/Organization invited to participate

Ghana

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