Title: **Crude oil characterization using SARA fractionation and GC-MS**

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Crude oil is a naturally-occurring liquid mixture, composed of hydrocarbons as well as oxygen, nitrogen and sulfur-containing compounds. While previous research has been able to identify broad differences between classes of crude oil, the elucidating the structure of compounds within oils remains elusive, especially for heavier compounds. To determine the composition of Boscan, a heavy crude oil, SARA fractionation was performed to separate the sample into 4 different classes of chemical compounds: saturated hydrocarbons, aromatic compounds, resins, and asphaltenes. A sample of oil was chromatographically separated on activated alumina using solvents of increasing polarity. Each fraction was analyzed using gas chromatography coupled to mass spectrometry (GC-MS). Several series of hydrocarbons were seen in each fraction, separated by *m/z* and polarity. GC-separated isomers were seen in several of the samples. While all samples emitted between 320 and 540 nm, the wavelength of maximum emission changed between fractions, exhibiting redshifted and blueshifted spectra. This correlates well with crude oil samples found in the literature, which emit between 400 nm and 500nm range, attributable to large conjugated aromatic structures (with a minimum of three rings).