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Sensitive Molecular Spectroscopy of Crude Oil and Well Gas Samples YAKUP BORAN, Texas A&M University, A.H.M JAHANUR RAHMAN, Texas A&M University in Qatar, Doha, Qatar, NECATI KAYA, Texas A&M University, JAMES STROHABER, Florida A&M University, ALEXANDRE KOLOMENSKII, Texas A&M University, MAHMOOD AMANI, VASSILIOS KELESSIDIS, Texas A&M University in Qatar, Doha, Qatar, HANS SCHUESSLER, Texas A&M University — We have developed several sensitive laser and mass spectroscopy based analytical instruments for oil and gas analysis. Some of the approaches have the potential for near well applications. A portable quadrupole mass analyzer is capable of measuring hydrocarbons having hundreds of atomic mass units as well as to low mass targets, such as methane and carbon dioxide at ppm level concentrations. In addition, a small prototype handheld optical absorption sensor is available. Here we use the quadrupole mass analyzer and reflectron-type time-of-flight ion mass spectrometer. An important advantage of the reflectron apparatus is due to the use of femtosecond laser radiation. Such strong field radiation can defeat the dissociation rate of molecules allowing for intact molecular ions to be detected. Fragmentation free detection of target molecular ions facilitates interpreting the amount of a particular hydrocarbon molecule. We will present results on crude oil and well gas analysis, which yields information on wide range of hydrocarbon constituents. Supported by the Qatar Foundation under grant NPRP 6-465-1-091 and the Robert A. Welch Foundation under grant No. A1546.

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