Gas Production Composition Determined With Direct Quadrupole Mass Spectrometer (DQMS) While Drilling

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The accuracy and reliability of well data has become crucial in developing oil and gas production. The use of well data ranges from reservoir evaluation to production planning. A useful parameter often overlooked due to a history of poor accuracy and reliability is hydrocarbon composition from mud gas. Hydrocarbon composition can be used as an indicator of thermal maturity and production type (liquid or dry gas). DQMS analysis of mud gas while drilling provides hydrocarbon composition with greater accuracy than other field instrumentation and with faster results than laboratory production analysis. The DQMS hydrocarbon compositions from mud gas were compared to lab analyses of gas production from 8 horizontal shale wells with varying production character (1316-1021 BTU). Results show gas compositions calculated from DQMS reading are accurate and reliable. Hydrocarbon basis BTU calculated from DQMS data for the 8 wells had an average percent error of 1.162 and a standard deviation of 1.021 from hydrocarbon basis BTU lab analysis.