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New Applications to Assess Reservoir Quality in Oil Reservoirs Using Pyrolytic Techniques

Reservoir characterization, while most commonly accomplished through well log interpretation, has always relied on supplemental techniques as a means to confirm interpretations or augment the information with parameters that cannot be obtained through log analysis alone. Additional information from well testing or core analysis becomes especially important when well log data prove to be ambiguous, and therefore inconsistent with other supporting data. These problems can be critical when the data are being used during active drilling operations and especially during horizontal drilling when employing logging while drilling (LWD) tools.

In order to assist with such circumstances, new pyrolytic methods have been developed to quantitatively assess reservoir quality from residual staining on drill cuttings and core. The advantage of these methods is that they can be applied directly to drill cuttings or core chips, independently of other methods for assessing oil productivity and other reservoir parameters (i.e., no supporting reservoir data are required, only crushed rock samples). A field instrument has been developed, based on these methods, to assist while employing logging while drilling (LWD) tools as an aid to "geosteering" horizontal wells. This instrument is currently being employed in Saudi Arabia at selected well sites to assist in a variety of projects.

The methods offer cost-effective tools to assess the quality of oil reservoirs and can be applied to a broad range of problems from reserves assessment, special core analysis, reservoir modeling, development planning, and well site analysis during drilling operations.