# Hydrocarbon identification by ditch cutting analysis

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Ditch cutting analysis allows the well site geologist to recognise and differentiate various types of hydrocarbons (gas, condensates, producible and residual oil) in a real-time basis (during drilling operations).

This paper outlines a systematic and effective approach for the recognition of hydrocarbons based on numerous years of experience in the subject and will be illustrated with a number of real cases.

The method described herein includes five specific interdependent steps, under the keyword **AEDES**:

i) Acquisition of good quality rock cuttings;
ii) Examination and description of samples;
iii) Diagenetic evaluation of the formation;
iv) Evaluation of hydrocarbon vs rock fluorescence;
v) Saturants type analysis

Identification and differentiation of hydrocarbons can then be carried out by a number of independent techniques, the main one being ultraviolet luminescence analysis, which involves six main distinctive confirmatory tests:

a) Distribution of natural fluorescence;
b) Intensity of natural fluorescence;
c) Colour of hydrocarbon fluorescence;
d) Chlorothene's solvent cut colour;
e) Chlorothene's solvent cut fluorescence;
f) Acetone/water reaction test.

Tests (a) to (e) are used for hydrocarbon differentiation ranging from 10 to 45 API oils, whereas the acetone's test is extra sensitive for condensates and gas.

**Gas** is always characterised by a weak to moderate whitish blue natural fluorescence and a slightly translucent acetone reaction test.

**Condensates** generally exhibit a wide range of natural fluorescence, from bluish to creamy-white and a brilliant white solvent (chlorothene) cut accompanied by a translucent to slightly opaque acetone reaction test.

**Oil** shows a wide range of natural colour fluorescence, from white to green, yellow, gold, orange, brown, coffee and violet. Formation of streamers during the making of the solvent cut is an excellent diagnostic for an oil test. Natural fluorescence of oil in the transition zone, above the free water level in the reservoir, is always mottled in appearance with dulling of the primary oil natural fluorescence. Finally, residual oil produces a violet natural fluorescence and almost always a solvent (chlorothene) cut colour is present.



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