

Title (en)
METHOD AND APPARATUS FOR A DERIVATIVE SPECTROMETER

Title (de)
VERFAHREN UND VORRICHTUNG FÜR EINEN DERIVATIV-SPEKTROMETER

Title (fr)
PROCEDE ET APPAREIL POUR UN SPECTROMETRE PAR DERIVATION

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Application
EP 03739037 A 20030604

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Abstract (en)
[origin: WO03102520A1] The invention comprises a method of adapting derivative spectrometry for use in a downhole environment and addresses problems that are inherent in this environment. Such problems include, but are not limited to, elevated temperatures and scattering from particles residing within dirty fluid samples. Under such conditions, the photometric resolution of a spectrometer decreases at the same time that the need for better resolution increases. The invention improves the resolution by measuring the first derivative of the spectrum. The derivative spectrometer of this invention operates by vibrating a linear variable interference filter back and forth along the plane of the filter or by oscillating a circular variable filter about some angle. The effect is to oscillate the wavelength of light that is received by each photodetector. The photodetector signal can be electronically filtered to reject signals that are not at the oscillation frequency and which do not have a fixed phase relative to it. In a preferred embodiment, a vibrating actuator is the means to achieve the required oscillations about a given wavelength. Derivative spectrometry gives a higher resolution than normal methods of spectrometry. Through improved resolution, it is possible to estimate the contamination percentage of the crude oil in real time. Furthermore, it is possible to determine whether a contamination percentage is leveling off over time. It is expected that high-resolution spectra enable an improved estimation of the percentages of methane (natural gas), aromatic, olefins, saturates, and other crude oil properties.

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