QUANTITATIVE ANALYSIS OF OIL BASED MUD FILTRATE INVASION

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ABSTRACT Mud filtrate invasion into core material taken from oil reservoirs may cause problems for future core analysis studies due to the potentially damaging effect of the mud filtrate upon the rock's wettability. It is therefore desirable in these situations to minimise the degree of invasion and accurately measure the success of this minimisation. There is much discussion in the literature of tracer techniques but all of these require well site activity as well as tracer purchase and handling. A quantitative technique is presented which requires no tracer to be used and is quick and easy to perform. The process involves Gas Chromatography finger print analysis of both reservoir crude and mud filtrate. High contrast characteristics are identified and quantified for known ratios of mud and crude thus generating a calibration curve. Hydrocarbons are then solvent extracted from the core trims which may be as small as 1.50" diameter and 0.25" thick. The effluent is then boiled down (taking care to minimise carry over) to concentrate the hydrocarbons extracted. The residue is then analysed using GC and related to the calibration curve generated previously. Experimentation to date has suggested that the technique is accurate to within approximately +/- 2 wt%. The resolution also depends to some extent on the hydrocarbons present.