DEVELOPMENTS IN I-S_w MEASUREMENTS

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Abstract Resistivity index measurements (I-S_w) are nowadays routinely carried out at Shell Research, Rijswijk with the continuous injection (CI) method. In this technique one fluid phase is continuously displaced by another, while the injection pressure, the fluid saturation and the resistivity across the sample are recorded. The growing demand for measurements at more realistic reservoir conditions stimulated the development of a CI technique that enables isostatic stress conditions and injection pressures up to 60 bar to be applied, the latter being of importance for tight core material. Experiments carried out so far indicate a possible effect of stress on the resistivity index, this depending on the porosity. To study the effects of wettability and to gain a better grasp of the relationship between resistivity logs and laboratory core measurements, the RIMARC (resistivity index measurement at reservoir conditions) equipment was developed, in which CI-like measurements can be carried out at reservoir conditions of pressure, temperature and stress, with 'live' reservoir crude and brine as pore fluids. Scouting experiments have revealed a good similarity in results between this equipment and the 'standard' CI set-up when measurements are carried out under the same conditions.

The first experiments at reservoir conditions are compared with the standard measurement.