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SIMPLE AND ACCURATE METHODS FOR CONVERTING CENTRIFUGE DATA INTO DRAINAGE AND IMBIBITION CAPILLARY PRESSURE CURVES

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ABSTRACT

There are various methods to reduce drainage centrifuge data to capillary pressure curves. Simple methods usually lead to poor accuracy in the results, while accurate methods, usually longer to operate, need to smooth, fit, average or force the experimental data in a given analytical form . This could be questionable and lead to significant errors in computed capillary pressure curves and consequently in computed irreducible saturation.

This paper first deals with an accurate method which is rapid to process, if the drawbacks of fitting the data in a given analytical form are accepted. The method also allows the corrected USBM wettability index to be calculated easily directly from the raw centrifuge data.

Second an accurate, very rapid and simple method is proposed. It allows to convert experimental data, even if they are noisy or few. It needs no smoothing, fitting, averaging or forcing of data, or of result, in any given form. Therefore it is believed to produce capillary pressure curves which correspond more closely to the centrifuge data than the curves which may be obtained from most other methods. The method applies to both drainage and imbibition centrifuge data. It is even simpler for imbibition.

Our first and second methods are demonstrated on both artificially generated and experimental data.