

SALT DYNAMICS: EXCESS MATURITY, TIMING AND FLOW-SPEED

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ABSTRACT

A method for assessing the time of onset of diapirism and salt flow-speed is demonstrated. Using vitrinite reflectance measurements from wells drilled on top of a salt structure it is possible to determine the excess maturity caused by the focusing of heat due to the higher thermal conductivity of salt. The method is based on calculation of the thermal anomaly surrounding a rising salt diapir. For a given salt speed a time-temperature-integral is calculated and converted into a synthetic vitrinite reflectance value.

The modelled vitrinite reflectance values are compared with the observed values at given depths, and the process repeated with various speeds of the rising salt until consistency of predicted and observed values is obtained. The method can easily be tailored to thermal indicators other than vitrinite reflectance thereby enhancing the resolution of the thermal history and constraining both the onset of salt rise as well as the speed. The well, Lulu-I, from the Danish North Sea, is a case history used to illustrate the procedure.

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