



Total Organic Carbon prediction in shale gas reservoirs using fuzzy logic

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Here, we suggest the use the fuzzy logic approach for the prediction of the Total Organic Carbon (TOC) from well-logs data in shale gas reservoirs, two models are used for the estimation of the TOC from well-logs data; the first one is called the Schmoker's model while the second one is called the Passey's model. Schmoker's model requires the continuous measurement of the Bulk density, in case of absence of the bulk density measurement the Schmoker's model is not able to predict the TOC. In this case we suggest the use fuzzy logic system able to predict the total organic carbon in shale gas formations. The input of the fuzzy system is the four raw well-logs data measurements corresponding to the natural gamma ray, the neutron porosity, the slowness of the primary and shear waves. The desired output is the calculated TOC using the Schmoker's model. Application to well-logs data of two horizontal wells drilled in the lower Barnett shale clearly shows the ability of the fuzzy logic approach to suggest values of the total organic carbon in case of no bulk density measurement.

Keywords TOC, Schmoker's model, Fuzzy logic, shale gas, Barnett shale, prediction.