

# **Experimental Investigation of Pore Evolution in Organic-rich Bakken Shale with Thermal Maturation Induced by Hydrous Pyrolysis**

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## **ABSTRACT**

The Bakken shale formation is one of the largest shale oil reserves worldwide located in the Williston Basin, North America. Understanding the pore evolution during kerogen maturation in unconventional shale reservoir is important to estimate their storage properties and pressure transport thus enhancing the hydrocarbon recovery from such massive resources. Two immature samples were taken from Bakken shale formation. The samples were artificially matured through hydrous pyrolysis to get six different thermal maturity level (325°C, 350°C, 375°C, 400°C, 450°C), and then a series of Rock-Eval analysis, nitrogen and carbon dioxide adsorption and SEM image observation will be conducted on the rock residues created at different maturity level. From the result of nitrogen and carbon dioxide adsorption on rock residual obtained from different maturity levels, how the pore structure (pore size distribution and Brunauer-Emmett-Teller surface area) changes with thermal maturation will be examined; we then examine the changes of pore morphology under SEM. In the end, the relationship between TOC content and porosity, pore structure will be discussed.