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Characterizing Multiscale Geometry, Anisotropic Behaviors, Bulk Properties, and Wettability of the Woodford Shale

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Summary

I am Pratap Bohara--a fourth year PhD student in the Department of Geology and Geological Engineering at the University of Mississippi. I define myself as a dedicated research fellow with more than seven years of experience in the field of Geology and Geological Engineering.

The proposed study will integrate geology, geochemistry, and surface chemistry to advance understanding of oil and gas behavior within the Woodford Shale of Oklahoma. Although this unit has abundant kerogen, total organic carbon (TOC), a high hydrogen index (HI), a low oxygen index (OI), and is thermally mature seemingly making reservoir economic but natural variability in lithology, fabric and thickness has limited detailed evaluation of its economic potential. As the flow and storage of shale oil are both scale and time dependent, the results from conventional laboratory techniques may not be enough to characterize the Woodford play in a reliable manner. Shale heterogeneity directly influences its wettability – which is the preference of a solid to interact with fluid in the surface. This study will examine the effects of heterogeneity on dynamic wettability and correlates results to lithologic, geochemical, and surface chemical data to build a unified model.

Most of the fund for the project will come from American Association for Petroleum Geologists (AAPG) in the name of Grants-in-Aid whose deadline to apply was 2nd Dec 2019. AAPG each year provides grants ranging from \$ 500 - \$ 3000 to cover expenses directly related to the student's field and laboratory works. The AAPG Grants-in-Aid provides financial assistance to graduate student research which has application to the search for and development of petroleum and energy-mineral resources. The objectives of the proposed research perfectly fits the criteria of AAPG Grants-in-Aid program.