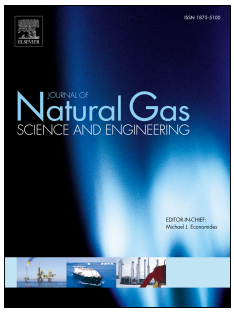
Accepted Manuscript



Virtual Special Issue: Advances in the Petrophysical and Geomechanical Characterization of Organic-Rich Shales

Mehdi Mokhtari, David Wood, Amin Ghanizadeh, Pandurang Kulkarni, Vamegh Rasouli, Ebrahim Fathi, Milad Saidian, Reza Barati

PII: S1875-5100(16)30952-0

DOI: 10.1016/j.jngse.2016.12.043

Reference: JNGSE 2017

To appear in: *Journal of Natural Gas Science and Engineering*

Please cite this article as: Mokhtari, M., Wood, D., Ghanizadeh, A., Kulkarni, P., Rasouli, V., Fathi, E., Saidian, M., Barati, R., Virtual Special Issue: Advances in the Petrophysical and Geomechanical Characterization of Organic-Rich Shales, *Journal of Natural Gas Science & Engineering* (2017), doi: 10.1016/j.jngse.2016.12.043.

Virtual Special Issue: Advances in the Petrophysical and Geomechanical Characterization of Organic-Rich Shales

Mehdi Mokhtari[1], David Wood[2], Amin Ghanizadeh[3], Pandurang Kulkarni[4], Vamegh Rasouli[5], Ebrahim Fathi[6], Milad Saidian[7], Reza Barati[8]

1. University of Louisiana at Lafayette, 2. DWA Energy Ltd, 3. University of Calgary, 4. Statoil, 5. University of North Dakota, 6. West Virginia University, 7. BP, 8. University of Kansas

Shale oil/gas reservoirs are unconventional hydrocarbon plays that are composed of a lithologically-diverse group of fine-grained sedimentary rocks including shales, mudstones, marlstones, limestones and siltstones. Organic-rich shales, as petroleum source rocks, could potentially retain a large proportion of the hydrocarbons generated during their diagenesis. Hydrocarbon storage within organic-rich shales is controlled by geochemical composition, pore network characteristics (surface area, pore volume, pore size distribution), temperature, pressure and moisture content. Hydrocarbon transport within organic-rich shales is controlled by the characteristics of the pore network system (porosity, pore throat size distribution, pore connectivity, permeability), permeating fluid, reservoir temperature/pressure and effective stress. Economic hydrocarbon flow rates/quantities in these reservoirs are attributed to the interconnectivity of meso- and macro-pores within the shale matrix and the extent of the natural and/or artificially-induced fracture systems. The presence of other fluid phases (gas/liquid) could also affect the hydrocarbon transport through these fine-grained sedimentary rock due to capillary processes that are partly controlled by wettability attributes (interfacial tension, contact angle, etc.). Mechanical characterization of organic-rich shales is a critical step in the evaluation of these unconventional reservoirs. Combined with the "in-situ" stress regimes, the geomechanical properties of unconventional reservoirs play a key role in drilling, completion and hydraulic fracturing.

Regardless of current low commodity prices, there is extensive global interest in opportunities to commercially exploit shale oil/gas resources. The hydrocarbon exploitation from these resources could potentially represent a shift in energy-related economics and politics. Commercial