

Title:

Early Phase In Situ RF Heating of Oil Shale: Issues and Modeling

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Recent laboratory studies indicate that the in situ volumetric heat deposition in oil shales using radio frequency (RF) energy will primarily be controlled by rock matrix water content and salinity during early phase heating (below kerogen decomposition temperatures). High water saturation and/or ionic content can limit the RF penetration depth and influence runaway heating near the borehole. This study examines the early phase of RF heating for a range of initial water saturation distributions to determine the initial conditions under which an RF heating process can be effective in volumetrically heating the formation without runaway borehole heating. The study uses the Non-isothermal Flow and Transport (NUFT) modeling code to approximate the RF heating process. The NUFT code can model the time-dependent temperature evolution and water and ion migration as the process evolves. The results are qualitative and meant to gain further insight into the ultimate feasibility of an RF in-situ heating and conversion process.

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