

OIL SHALE PYROLYSIS IN FIXED-BED RETORT WITH DIFFERENT HEATING RATES

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Abstract: Production of oil at pyrolysis of Ellajun oil shale was investigated at different heating rates (0.2, 2.8, 5.0 and 13.0 °C min⁻¹) in a fixed-bed retort. Total weight loss and oil yield were calculated for the temperature range 610–873 K. Total weight loss of oil shale sample increased from 12.5% to 18% with increasing the heating rate from 0.2 to 13 °C min⁻¹, whereas shale oil yield (calculated based on Fisher Assay for Ellajun sample) decreased from 80% to 40%. Sulfur content of produced liquid hydrocarbons decreased from 7.4 wt.% to 6.5 wt.% with increasing heating rate and pyrolysis temperature. Density of the produced shale oil increased from 0.947 to 0.982 g cm⁻³ with increasing heating rate indicating the formation of heavier compounds. The rate of shale oil accumulation was monitored by digital mass scales. Higher heating rates resulted in higher rates of accumulation. The rate of oil and water collection passed through a maximum for different heating rates at different pyrolysis temperatures.