

**Effect of demineralization and heating rate on the pyrolysis kinetics of Jordanian oil shales**

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**Abstract:** The effect of mineral matter content on the activation energy of oil shale pyrolysis has been studied. Kerogen was isolated from raw oil shale by sequential HCl and HCl/HF digestion. Oil shale and kerogen samples were pyrolyzed in a Thermogravimetric Analyzer at different heating rates (1, 3, 5, 10, 30, and 50 °C/min) up to a temperature of 1000 °C. Total mass loss of all oil shale samples remained almost constant irrespective of the heating rate employed, whereas it decreased with the increase of heating rate for kerogen (74.5 to 71.4%). From the pyrolysis profile activation energy ( $E_a$ ) was found to vary between 70 and 83 kJ/mol for oil shale, while 82–112 kJ/mol has been determined for isolated kerogen. An increase of both  $E_a$  and pre-exponential factor was observed with an increasing heating rate. It is concluded that the mineral matter in oil shale enhances catalytic cracking as is evident from the reduced  $E_a$  values of oil shale compared with those for kerogen.