

New approach for kinetic modeling of El Lajjun oil shale extracted kerogen

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In the present study, least-square approximations together with finite difference schemes have been applied in nonlinear isoconversional calculations for the determination of activation energy values of kerogen pyrolysis. Nonisothermal kinetic conversion data of El Lajjun oil shale extracted kerogen have been introduced. The corresponding pyrolysis experiments have been performed in a thermogravimetric analyzer system at temperatures up to 550°C and with heating rates of 1, 3, 5, 10, and 30°C /min. Valid activation energy values, as a function of conversion, and average activation energy have been predicted accurately. In addition, the activation energy values obtained from the proposed technique are compared with those obtained from the Friedman method. This new approach allows the estimation of activation energy as a function of conversion without introducing any systematic error.