Pyrolysis of Turkish oil shales from Beyazari, Seyitömer and Himmetoğlu deposits has been studied and oil yields determined. Two different experimental set-ups – a lab-scale and a Corexport 7000 model standard pyrolysis units were used. For comparison pyrolysis experiments with Fischer apparatus were carried out. In all experiments, particles of the size between 0.7 and 2.83 mm were used. FT-IR, as well as $^1H$ and $^{13}C$ NMR spectra of oils were obtained. Elemental analysis of raw shales, spent shales and shale oils was made.