

#### 10.4 **Oil Shale Pyrolysis Modeling**

Ramesh Sarathi

*ConocoPhillips, Bartlesville, OK, United States*

Retorting oil shale presents many engineering, environmental, and economic challenges. To address these challenges, one must first understand the chemical and physical mechanisms that occur while retorting oil shale. In this paper we review literature studies of oil shale pyrolysis chemistry and develop a mathematical model of the reaction dynamics. The model accounts for several reactions, including kerogen pyrolysis, char pyrolysis and gasification, oil coking and cracking, and carbonate mineral decomposition reactions. By combining reaction stoichiometry and kinetic parameters from several different studies into a single model, we are able to closely match the experimental data found in the literature.