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Permeability changes of fractured oil shale cores during retorting

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Converting kerogen to a liquid/gas product will result in a change of oil shale matrix and fracture porosities and permeabilities. Prior to retorting, both the mineral matrix and the kerogen support the *in situ* stress of the lithostatic load. As the kerogen is heated and converted to liquid/gas products, the stress can increase. Then, as the product is expelled, the stress field is transferred to the mineral matrix. Some researchers have suggested that porosity and permeability will both increase due to the expulsion of the product. Other research suggests that the additional stress on the mineral matrix will lead to reduced porosity and permeability following fluid expulsion. We have conducted a series of laboratory-scale retorting experiments under confined stress to examine changes in porosity and permeability. Both hydrous and anhydrous oil shale retorting experiments are conducted under lithostatic axial stress conditions. Permeability of matrix and fractures are measured before and after the retorting experiments. Preliminary results suggest significant compaction of the oil shale can occur during high temperature retorting. Permeability decreases of 2 to 3 orders of magnitude have been measured in fractured systems. In this presentation, we will discuss the experimental method, resulting porosity and permeability changes, and potential implications to product recovery and remediation of *in situ* oil shale retorts.