3.1 **Constant pressure retorting of oil shale**

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Most laboratory oil shale assays are conducted in systems that run at or near atmospheric pressure (e.g., Fischer Assay, thermogravimetric analysis, Rock Eval) or under closed conditions at much higher pressures often in excess of 2000 psi (e.g., hydrous retorts). Neither of these approaches mimics the gaseous pressure conditions we expect to see in most in-situ retorts. Although, other researchers have suggested that the absolute gas pressure is not an important variable in determining oil quantity, the presence of water during the pyrolysis reaction has a significant effect on the quality of oil produced. Atmospheric assay systems will generally remove the water from the reactor before retorting temperatures are achieved resulting in oil/gas products with different compositions from that expected to be generated at in-situ field retorts. While water is present in hydrous retort assays, the high in-situ retorting temperatures would result in saturated water vapor pressures that are unsustainable for most in-situ retorts. We report here on a back-pressure gas control system for laboratory retorting of oil shale that we believe more closely mimics in-situ oil shale retorting gas pressure conditions at proposed in-situ field sites. The experimental setup consists of a high-pressure vessel containing the oil shale that is connected to a condensing sample cylinder and a backflow pressure regulator. The liquid oil quantity and quality as well as the gas composition results from experiments conducted in this apparatus are compared to results from hydrous and anhydrous systems.