Resistivity measurements of oil shale cores as a function of temperature

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Relatively few measurements of the electrical properties of an oil shale sample have been made as a function of temperature. Such measurements are complicated by the interplay between the equipment needed to make such measurements, the properties of the shale, the temperature at which these measurements need to be made, and the byproduct of shale heating (i.e., production of oil). These complications are a likely reason for why there are so few measurements of oil shale resistivity as a function of temperature. From our own experience, Bridges et al. (1982) are correct in their statement that each test "consumed considerable effort". In addition to the above mentioned issues, the tests have to be conducted in an inert gas environment to prevent combustion and have to account for sample plastic deformation as the kerogen undergoes pyrolysis. Our experimental efforts followed the general approach and designs discussed in Debow and Rajeshwar (1980), Bridges et al (1981) and Duba (1982). We limited our testing to examine the effects of ramping rate on the measurements and limit the deformation by applying a limited overburden stress. Experimental results are consistent with previous researchers with resistivity varying about 4 orders of magnitude over a temperature range of 25 to 400 °C.