PIWINSKII, A. J., and Duba, A., Electrical conductivity and dielectric properties of oil shale, Eos Trans. AGU 56, 458 (1975). [UCRL-76604, Abstract]

The electrical conductivity (σ) and the real part of the complex permittivity (ε') of oil shale from the Parachute Creek member of the Green River formation, Piceance Creek Basin, Colorado, were measured under ambient conditions. The three-electrode technique with a guard ring was used over the frequency range 50 Hz to 10 kHz. Right circular cylinders (25.4-mm diam), perpendicular to the bedding planes, of 9.8 to 60.9 gal/ton oil shale, were vacuum dried for 72 h at approximately 348 K prior to investigation. A linear correlation was found to exist between σ and grade of oil shale, as well as between ε' and grade (e.g., at a ν of 200 Hz, $\varepsilon' = -2.3 \times$ yield [gal/ton] + 180.4). After retorting up to temperatures of 800 K, the σ (10 kHz) of a 15-gal/ton sample decreased by a factor of 20; ε' decreased by about 35. These new data indicate that σ and ε' are related to the oil content of the shale from the Piceance Creek Basin. Therefore, measurements of these electrical properties might be used to monitor the retorting of oil shale in situ.

PIWINSKII, A. J., and Duba, A., Feldspar electrical conductivity and the lunar interior, Proc. Sixth Lunar Sci. Conf., 2899-907 (1975). [UCRL-76755, Preprint]

We propose a new model for the structure of the lunar interior to about 250-km depth. We suggest that this region is composed of plagioclase-bearing rocks and that a gradual increase in garnet occurs at depths below 65 km. We envision a variety of rock types composed mainly of plagioclase, pyroxene, olivine, and garnet with at least half of the outer 250 km of the moon composed of plagioclase in order that it dominate the electrical conductivity. This model, based on electrical conductivity results, does not violate recent petrological studies and velocity-depth profiles obtained from elastic wave studies of lunar and terrestrial materials.

PIWINSKII, A. J., San Francisco: a suburb of Los Angeles in 1999?, invited lecture, University of California, Santa Barbara, April 22, 1975. [UCRL-76783, Abstract]

In western California, Mesozoic calc-alkaline plutons, consisting of approximately 39% quartz monzonite, 36% granodiorite, 23% quartz diorite, and 1% gabbro-diorite, occur in terrains displaced by the San Andreas fault zone from Bodega Head south to the intersection of the Big Pine and Garlock faults.