petrological and electrical conductivity results and is consistent with lunar velocity-depth profiles and elastic wave studies of lunar and terrestrial materials.

Contemporary petrologic and seismic investigations of lunar materials have indicated that the crust is largely feldspathic. It appears to be composed of rock types ranging from anorthosite through norite to troctolite, which are commonly called the ANT suite. At the 1173-K isotherm, experimental data on gabbroic anorthosite indicate that plagioclase is stable to approximately 2.2 GPa, and a series of complex mineralogical reactions occurs among plagioclase feldspar, pyroxene, and garnet solid solutions over this pressure interval. The first appearance of garnet and its subsequent increase in amount with increasing pressure may result from the reaction of pyroxene with the anorthite component of plagioclase.

With regard to the electrical conductivity (σ) studies of the moon, the most prominent feature of the original lunar σ-depth profile is the "spike" centered at an approximate lunar radius of 1500 km. In less than 50 km, the σ increases almost three decades. Although the data may be fit with a more traditional monotonic profile, the σ spike still represents the mathematically-preferred solution.

Recent σ investigations on albite provide an explanation for the σ spike and also suggest a method of reconciling diverse petrologic and seismic constraints on the composition of the lunar interior. These studies indicate that the σ of single-crystal Amelia albite increases about four decades isothermally at temperatures greater than 1253 K after times greater than 3200 h. This dramatic increase in σ was attributed to an increase in the total disorder in this albite at elevated temperatures. Thus, a possible explanation of the σ spike centers on order-disorder phenomena in plagioclase feldspar. We propose that the outer 250-300 km of the moon is composed of a plagioclase-bearing rock. If this model is correct, the temperature at the σ spike may be uniquely determined as that temperature where significant disorder commences in the plagioclase feldspar. We also suggest that within the upper 300 km of the moon, a series of related mineralogical reactions occur among coexisting plagioclase, pyroxene, and garnet solid solutions. We envisage a variety of rock types stable within the ANT suite to pressures where plagioclase disappears. This petrologic association is consistent with the range in P-wave velocities reported for the moon's interior.