

Electron Microscopic Study of Domains in Lunar Minerals

by

H.-U. Nissen \*

Labor fur Elektronenmikroskopie, ETH-Aussenstation  
Honggerberg, 8049 Zurich, Switzerland

and

Walter Bollmann

Advanced Studies Center, Battelle Institute,  
Geneva, Switzerland

Feldspar, pyroxene, ilmenite and olivine from Apollo 11 and 12 crystalline rocks have been examined by scanning electron microscopy and by transmission and diffracted electron microscopy utilizing a 100 Kev machine equipped with a tilting stage, and the Harwell 1000 Kev machine. Much detail of domain size and shape is visible on growth surfaces of lunar minerals and will be illustrated.

Significantly more detail of feldspar domain structure is apparent from electron diffraction and transmission studies than from x-ray diffraction studies. Indexed electron diffraction patterns showing characteristics of diffuse and elongated intensity distributions will be discussed. At least one new type of reflection has been observed. Image enhancement techniques were used to demonstrate the presence of very weak reflections. Transmission electron photomicrographs illustrate 'c-domains' for the first time. Interpretations of domain sizes and orientations will be presented, and dislocation nets and stacking faults will be illustrated.