ABUNDANCES AND DISTRIBUTION OF ORGANOGENIC ELEMENTS AND COMPOUNDS IN APOLLO 12 LUNAR SAMPLES


Examination of the Apollo 12 lunar samples by methods similar to those we applied to the analysis of Apollo 11 material has yielded the following results. Several analyses by spark ionization mass spectroscopy of the organogenic elements, C, P, and S, gave values of 230, 190-820, and 690-3000 ppm, respectively, which are of the same order of magnitude as the ones obtained for Apollo 11 samples. The major components evolved by heating from the lunar samples were studied. In one experiment an EAI quadrupole residual gas analyzer yielded data on the evolution of \( \text{H}_2 \), \( \text{He} \), \( \text{N}_2 \), \( \text{CO} \), and \( \text{CO}_2 \) from 25 to 750°C. Traces of benzene and other volatiles were also observed in this experiment. In another thermal experiment the samples were heated to temperatures from 25 to 1500°C in a Mettler vacuum thermal analyzer and the effluent gases analyzed by a Finnegan quadrupole mass spectrometer, yielding more detailed information on the evolution of \( \text{CO} \), \( \text{N}_2 \), \( \text{CO}_2 \), \( \text{H}_2 \text{S} \), \( \text{SO}_2 \), \( \text{H}_2 \), \( \text{He} \), and other chemical species. The latter results will be compared to those obtained in the above experiment (up to 750°C) for the Apollo 12 samples, as well as to those obtained previously on Apollo 11 samples by the differential thermal analysis-high resolution mass spectroscopy and other techniques. Data on extractable organic compounds, amino acids, products of acidolysis and carbon isotopic ratios will also be presented.