

COMPARISON OF THE ANALYTICAL RESULTS

FROM THE SURVEYOR, APOLLO, AND LUNA MISSIONS

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The analytical results on lunar fines from five mare sites indicate a generally basaltic composition at all four maria that have been studied, with low sodium and relatively high titanium as compared to most terrestrial basalts. These analyses suggest that most, if not all lunar maria have this gross chemical composition. The main differences in the amounts of principal constituents in the various maria are the variation by a factor of two in titanium content and a variation in the iron-to-silicon and magnesium-to-silicon ratio, with consequent variation in olivine as compared to pyroxene and silica contents.

The chemical composition of the single highland site studied (Surveyor 7) is distinctly different from that of any of the maria in having much lower amounts of titanium and iron and larger amounts of aluminum and calcium. The inferred mineralogy is high anorthite and low silica with perhaps even some olivine. The apparent presence of 0.3 atom percent of fluorine is particularly interesting and may indicate some fluorine replacement of oxygen in the highland silicates. The Surveyor 7 chemical analysis is the principal contributor to present estimates of the overall chemical composition of the lunar surface.