Li, K, Rb, Sr, Ba and rare-earth concentrations and $^{87}\text{Sr}/^{86}\text{Sr}$ in some Apollo 12 soils, rocks and separated phases.

by

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Three samples of Apollo 12 fines, four core samples and a breccia have very similar relative concentrations of Li, K, Rb, Sr, Ba and rare-earths; absolute concentrations differ from the average by up to 20%. K, Rb, Ba and the light rare-earths are approximately twice as abundant as in Apollo 11 fines, whereas Sr, Eu and the heaviest rare-earths are about at the same levels. An exception is 12028/65, a coarse sample from a core, which has trace element contents similar to those of the Apollo 12
igneous rocks. These are characterized by lower trace element contents than the enriched Apollo 11 igneous rocks and lower rare-earths, particularly Gd through Lu, than the depleted ones; Eu anomalies are smaller. Trace element concentrations in Apollo 12 igneous rocks are similar to, and overlap, those in the basaltic achondrite meteorites. Mineral data show similarities to those for equivalent Apollo 11 phases; Eu distribution indicates comparable redox conditions. The trace element content of the Apollo 12 soil could be obtained by mixing about four parts of Apollo 12 igneous rock with one part of the dark portion of the unique sample 12013, the portion that could be an extreme basalt differentiation product. Such mixing would also appear to be consistent with the $^{87}\text{Sr}/^{86}\text{Sr}$ systematics.