

Rare Earths and Other Trace Elements in Apollo 12 Lunar Samples

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Abstract

Nine samples of igneous rocks and four samples of fine material from the Apollo 12 mission have been analyzed for 12 of the rare-earth elements (REE) by neutron activation analysis. Four samples of the rocks and three samples of the fine were analyzed for 25 additional elements. The REE concentrations in all but one of the igneous rocks from Apollo 12 are lower than those found for any igneous rock from Apollo 11. The relative REE abundances are similar to those of the Apollo 11 rocks, except Eu is not quite as strongly depleted. The Apollo 12 fine materials have higher REE concentrations and greater Eu deficiencies than the Apollo 11 fine material, especially for the lighter REE. The REE abundances of "fine" fines and "coarse" fines (12070) are identical, but there are significant differences in their concentrations of As, Co, Sb, Se, and Zn.