

# **The evidence of lunar mare volcanism of Ti, Fe, Ca, Mg, K and Th as observed by gamma-ray spectrometer on board Lunar Prospector**

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The relative abundances of the elements as Titanium, Iron, Calcium and Magnesium have been deduced by analyzing the observed results obtained by gamma-ray spectrometer on board Lunar Prospector. These results obtained for five lunar mares as Procellarum, Imbrium, Crisium, Serenitatus and Tranquillitatis were analyzed as regards of chemical compounds as  $\text{TiO}_2$ , FeO, CaO and MgO and the elements, K and Th, all of which were observed by the gamma-ray spectrometer. The results obtained from these analyses are summarized as follows: 1) the abundance of  $\text{TiO}_2$  is inversely correlated with that of CaO, 2) The abundance of  $\text{TiO}_2$  is well correlated with that of FeO. Furthermore, the latter abundance in Mare Tranquillitatis is lower than that in PKT (Procellarum KREEP Terrane), 3) The abundance of  $\text{TiO}_2$  is further inversely correlated with that of MgO, 4) Two elements, K and Th, give a clue to lunar geological processes as volcanism and 5) the results shown here indicate that the chemical compositions of mare cumulates are characteristically different from each other, though their properties are not much different among them. These results suggest that high concentration of  $\text{TiO}_2$  was produced from the volcanic eruptions shortly after early meteoritic impacts, but this tendency was reduced from the sinking of lunar materials in later phase of the lunar evolution. The data used in this study were supplied from the Lunar Prospector Spectrometer team, to which we all are indebted as much.