

## THE CHEMICAL COMPOSITION OF THE MARTIAN CRUST

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The Pathfinder mission yielded the first in situ analyses of the chemical composition of Martian rocks with the APX-Spectrometer. Surprisingly, the rocks are chemically very different from the soil, but very similar to each other. On the other hand, the chemical composition of the soils at the Viking and Pathfinder landing sites resemble each other, even with their high sulfur and chlorine concentrations, in contrast to the rocks. The observed good correlation of S versus Mg, Si, Cl, K, and Ti for the Pathfinder samples reflects the fact that sulfur poor rocks are partly covered with sulfur rich soils. However the absence of a correlation of P versus S in all Pathfinder samples indicates that the rocks are not enriched in P when compared to the soil. This is in contrast to the correlated variation of potassium, a further incompatible element. This fact may point to a sedimentary, rather than an igneous origin of these rocks. The similar composition of soils at Chryse, Utopia and Ares Vallis is a strong indication of good mixing of surface material. Hence, the average chemical composition of the soil can be taken as the average composition of the martian crust. When S and Cl are subtracted, this soil composition comes close to that of the basaltic martian meteorites. Interestingly, the estimated crustal P concentration is very high when compared to terrestrial values. However, this should be expected from the predicted high P concentration in the martian mantle, as was derived from the SNC meteorites.