Granite: a planetary point of view.

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Telluric planets and the asteroid belt are made up of a metallic inner core and a silicate outer shell. Experimental data and petrological evidence show that, in silicate systems, granite can be produced through all types of magmatic processes. Extra-terrestrial granite is found as silicate inclusions in iron meteorites and LL-type chondrites.

On Moon, 4.4 to 3.9 Ga granite clasts display a dry mineral assemblage. Large K/Ca enrichment and low REE abundances in granite relative to KREEP are consistent with silicate liquid immiscibility. No granites are found in SNC meteorites, but a component close to terrestrial continental (granitic) crust is inferred from trace element and isotope systematics. Martian samples yield 45 to 62 wt% SiO_2. Black-and-white rhythmic layers observed on the flanks of Valles Marineris and of the giant volcanoes of Tharsis Montes suggest occurrence of felsic pyroclastites. Like northern Mars, Venus suffered volcanic resurfacing during the past 500 My, folded and faulted areas resemble terrestrial continents. Again, the hypothesis of a granitic component is "tantalizing".

Granite, a major component of terrestrial continental crust, is generated in all geodynamic sites. Low density of granite favours continental accretion. Thus, occurrence or absence of granite within other telluric planets is not a trivial question. Granite was thought to be produced through "wet" processes. From lunar evidence, dry conditions apply as well. In planets with high rates of magma production, such as Venus, it is speculated that significant volumes of granite can develop.