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Physical sense of massive development of low density minerals on the highly standing southern hemisphere of Mars

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Rotating celestial bodies are built with variously uplifted tectonic blocks of various sizes. The largest blocks are two hemispheres or two antipodean segments: one uplifted and the opposite subsided (a consequence of the wave structurization [1& others]). Having differing planetary radii and same angular velocities of rotation, these blocks must equilibrate their angular momenta by differing densities of infilling them materials (otherwise, a body will be destroyed like a not balanced car weal). For the terrestrial inner rock planets the nature normally uses dense basalts for infilling lowlands and lighter lithologies for building highlands. As relief ranges increase from Mercury to asteroids, density ranges between lowlands and highlands must also increase. Thus, in Venus it could be estimated as ∼0.1 g/cm3 (lowlands –Mg-basalt, highlands –alkali basalt), in Earth as ∼0.25 (tholeiite – andesite), in Mars as ∼ 0.45 (Fe-basalt – syenite, granite) [2-4 & others]. Further outwards, in the asteroid belt there are representatives of very dense lithologies (irons, iron-stones) and very light lithologies (carbonaceous material). Further inwards, in Mercury with its very low relief range prevail low Fe (?)- volcanics. Low density lithologies of martian highlands include already detected by various methods alkaline and subalkaline rocks (Columbia Hills) , dacites (THEMIS data), hydrosilicates and salts (Meridiani Planum and elsewhere). It seems that salts, judging by high contents in rocks S, Cl, Br, not only serve as very abundant cement for eolian sands but also impregnate magmatic and metasomatic highland rocks diminishing their density. The giant very high Martian volcanoes are poor in Fe but not very rich in Si (Gamma-ray orbital spectrometry), as one might expect. A reasonable explanation for this discrepancy is in a high share of salts in composition of their volcanics. yNumerous areas (from 1 to 25 square km) are detected on the highlands with spectral signatures of chlorides – they can indicate at widespread NaCl depositions (Mars Odyssey orbiter, M. Osterloo team of the Univ. of Hawaii, 2008). Zeolites replacing feldspathoids were predicted [4] and were reported among other not dense hydrated minerals [5] So, massive development of low density materials on the highlands serves as an effective tool for diminishing the angular momentum of the highly standing continental segment.
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