



Phyllosilicate-rich terrains on Mars identified by OMEGA/MEx: potential landing sites for astrobiology

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One of the goals of the present Martian exploration is to search for evidence of extinct (or even extant) life. This could correspond to a search for carbon. However, no deposit of carbonates has been detected so far on the surface of Mars. Of special interest are the numerous occurrences of phyllosilicate-rich deposits that have been identified in the Noachian terrains thanks to the OMEGA/MEx investigation (Poulet et al. 2005, *Nature*). The future in-situ exploration of Mars could be therefore redefined as a search for phyllosilicates. The presence of these minerals on Mars is of great exobiological relevance, because some of phyllosilicates are potential prebiotic catalyst (Ferris 2006, *Phil. Trans. R. Soc. B*). We review the different phyllosilicates-rich deposits identified so far by OMEGA. Different alteration models of mafic-ultramafic rocks are then discussed to explain the formation of clays: (1) gas-solid reactions; (2) weathering of the Martian crust below an ice-water interface; (3) impact into volatile-rich targets rocks, weathering with hot volatiles; (4) hydrothermal alteration of basaltic crust either by crater impact or by eruption through ground ice; (5) cooling of a magma enriched in volatile compounds; (6) alteration by leaching under ambient conditions. MicrOmega, the visible and near infrared microscope and imaging spectrometer aboard Exomars will provide essential information on the characterization and the selection of the samples related to potential habitability.