



Latitudinal distribution of conditions to support the formation of temporary liquid cryobrines on Mars

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Abstract

The liquefaction of cryobrines requires that simultaneously the environmental temperature is above the eutectic temperature and the relative atmospheric humidity exceeds the DRH (Deliquescence Relative Humidity). Modelling of the surface temperature and of the atmospheric humidity on the basis of the Mars climate model (MCD) and by using Phoenix data permits to study the conditions for the liquefaction of brines as a function of latitude and season. The results show that, in the presence of appropriate salts, liquid cryobrines can temporarily evolve at high latitudes on Mars' current climate. The conditions for the liquefaction of "Mars-relevant" cryobrines and the time and duration of their stability during the diurnal cycle are calculated and described for northern spring and for the region of the Phoenix landing site.