landers (evidence in favor of iron-rich clays is reviewed by [8] and [9]), their ability to absorb hydrogen could explain the otherwise puzzling tendency of the samples to generate oxygen when humidified [10, 11], even after heating. Previously, this tendency has been ascribed to soil superoxides [10] or to hydrogen peroxide generated by frost weathering [12].

In summary, iron-rich clays on Mars, if reduced, could become sources of hydrogen (without electrolysis), or could have acted as sources of hydrogen over geologic time, being oxidized and dehydroxylated in the process. Such oxy-clays have the potential, if placed in contact with water, to generate oxygen, because they should be sinks for hydrogen. This could have happened during the Viking gas exchange experiment. Experimental studies are needed to ascertain if this concept (iron clays as hydrogen sponges) is of practical or only theoretical interest.

References: