Stafford K. W.  Boston P. J.  
*Theoretical Evaporite Karst Development on Mars [#2291]*
Recent evidence of stratified sulfate rich rocks on Mars implies possible evaporite deposits. This suggests that evaporite karst and cave development similar to that observed on Earth may be present.

Chipera S. J.  Vaniman D. T.  Bish D. L.  Carey J. W.  Feldman W. C.  
*Experimental Stability and Transformation Kinetics of Magnesium Sulfate Hydrates that may be Present on Mars [#1497]*
The stability and kinetics of various Mg-sulfate hydrates were investigated at variable RH and temperature for extrapolation to Mars conditions. Epsomite, hexahydrate, starkeyite and kieserite show the largest stabilities but other hydrates persist.

Lane M. D.  Bishop J. L.  Dyar M. D.  Cloutis E. A.  Forray F. L.  Hiroi T.  
*Integrated Spectroscopic Studies of Anhydrous Sulfate Minerals [#1442]*
A suite of anhydrous sulfates were studied using visible/near-infrared reflectance, midinfrared emittance, and Mössbauer spectroscopies.

Rothstein Y.  Dyar M. D.  Schaefer M. W.  Lane M. D.  Bishop J. L.  
*Fundamental Mössbauer Parameters of Hydrous Iron Sulfates [#2108]*
Mössbauer data acquired at variable temperatures are presented. Results are used to determine the temperature dependence and recoil-free fraction of hydrous iron sulfates.

Sutter B.  Dalton J. B.  Ewing S. A.  Amundson R.  McKay C. P.  
*Infrared Spectroscopic Analyses of Sulfate, Nitrate, and Carbonate-bearing Atacama Desert Soils: Analogs for the Interpretation of Infrared Spectra from the Martian Surface [#2182]*
The infrared spectroscopic characteristics of Atacama Desert soils containing sulfates, nitrates, and carbonates are examined as potential analogs to Mars soils.

Hasenmueller E. A.  Bish D. L.  
*The Hydration and Dehydration of Hydrous Ferric Iron Sulfates [#1164]*
The dehydration/hydration behavior of jarosite and of the hydrated ferric sulfates kornelite, botryogen, and coquimbite, was analyzed by X-ray diffraction methods up to 300°C in vacuum. All three hydrous sulfates began to break down at ~50°C.

Jänchen J.  Bish D. L.  Möhlmann D. T. F.  Stach H.  
*Experimental Studies of the Water Sorption Properties of Mars-Relevant Porous Minerals and Sulfates [#1263]*
We evaluated experimentally water sorption properties of minerals identified by OMEGA in martian soil. Our results show up to 20% water in zeolites, clays, sulfates at martian surfaces conditions for equatorial latitudes as shown by Mars Odyssey.

Michalski J. R.  Kraft M. D.  Sharp T. G.  Christensen P. R.  
*Palagonite-like Alteration Products on the Earth and Mars I: Spectroscopy (0.4–25 microns) of Weathered Basalts and Silicate Alteration Products [#1188]*
Poorly crystalline silicate alteration products may be widespread on Mars. We discuss spectral evidence for these materials in weathered terrestrial basalts, similarities to spectra of Mars, and the implications for chemical alteration on Mars.
McAdam A. C.  Leshin L. A.  Sharp T. G.  Harvey R. P.  Hoffman E. J.
Investigation of Weathering Products of Martian Meteorite Analog Materials and Implications for the Formation of Martian Surface Fines [#2041]
We report on the mineralogy of an Antarctic Mars analog material. The mineral assemblage suggests that significant chemical weathering has occurred and that acid fog style weathering contributed to the production of chemical weathering products.

Kraft M. D.  Michalski J. R.  Sharp T. G.
Palagonite-like Alteration Products on the Earth and Mars 2: Secondary Mineralogy of Crystalline Basalts Weathered Under Semi-Arid Conditions [#1376]
In weathering rinds of crystalline basalts, we find poorly crystalline secondary silicates, similar to palagonites. Small volumes of these products cause rinds to have “glassy” thermal-IR spectra. Similar spectral surfaces on Mars may be altered.

Arlaukcas S. A.  McLennan S. M.
Dissolution Rates and Weathering Products of Iron-Titanium Oxides: pH and Temperature Dependence [#2011]
Experiments show that Fe-Ti oxides dissolve readily at low pH and temperature on short timescales. After dissolution in H2SO4, Fe-bearing sulfate minerals precipitate from the fluid. Dissolution rates and evaporite mineralogy will be discussed.

Hurowitz J. A.  Tosca N. J.  McLennan S. M.  Athena Science Team
Experimental Basalt Alteration at Low-pH: Implications for Weathering Relationships on Mars [#2025]
in situ analyses of Martian rocks and soils to experimental data from alteration of synthetic Martian basalt at low-pH are compared. Results indicate that dissolution of olivine at low-water to rock ratio is an important weathering process on Mars.

Marion G. M.  Kargel J. S.
Stability of Magnesium Sulfate Minerals in Martian Environments [#2290]
We will explore the thermodynamics of MgSO4 minerals on the surface of Mars.

Contribution of Organic Material to the Stable Isotope Composition of Some Terrestrial Carbonates as Analogs for Martian Processes [#1703]
A more thorough understanding of the effects of aqueous weathering and the potential contribution of organic compounds on the isotopic composition of Martian carbonate minerals can be gained by studying some terrestrial occurrences of carbonate rocks.