

McElvain Seminar In Analytical Chemistry

Dr. Richard Quinn

Perchlorates on Mars: Implications for Biomarker Preservation and Discovery

April 23, 2015 12:15 PM in room 1315

A major objective of recent Mars missions has been to assess the past habitability of ancient environments and to evaluate the environmental preservation potential of possible biomarkers. This exploration strategy has resulted in remarkable geological discoveries including a once habitable fluvio-lacustrine environment in Gale Crater, which is currently being explored with the NASA Mars Science Laboratory. However, the search for organic compounds on Mars, which serve as a key indicator of biomarker preservation potential, has been challenging. Nearly forty years ago the results of the Viking Biology Experiments showed, that in the presence of water, the martian regolith rapidly decomposes organic compounds. Decades later, after high levels of perchlorate were discovered using the Wet Chemistry Laboratory on the Phoenix Lander, a new understanding of martian soil chemistry has developed. In this seminar, the analytical methods that led to discovery of perchlorate on Mars and the potential impact of oxychlorine chemistry on biomarker preservation and detection will be presented.