
JOURNAL CLUB

Synergisms at Surfaces Involving Simultaneous Radiative and Chemical Stimulation

by

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ABSTRACT

Bond breaking at surfaces due to stimuli such as exposure of materials to electrons, ions, photons, mechanical stress, or chemical agents are well established. We discuss in general the role of multiple stimuli in the degradation and modification of materials and solid surfaces. In particular, we examine the phenomena of electron and laser stimulated decomposition/desorption from ionic crystals in the presence and absence of water vapor. We show dramatic synergistic increases in the rates of both chemical decomposition of the surface during irradiation with electrons and laser beams as well as the generation of unique nanometer scale surface features. To explain the observed phenomena and nanometer scale surface modifications, local bonding models involving defects will be presented. The surfaces of interest include single crystals of NaCl, NaNO₃, and CaHPO₄·2H₂O. The latter is a biomineral found throughout nature including the human body.

Friday, December 7
Room 417, IARC Bldg
3:45 pm