

Abstract Submitted
for the SHOCK09 Meeting of
The American Physical Society

Shock Chemistry of Organic Compounds Frozen in Ice Undergoing Impacts at 5 km s⁻¹ MARK BURCHELL, Univ. of Kent, JOHN PARNELL, STEPHEN BOWDEN, Univ. of Aberdeen — The development of complexity in organic compounds is a key step in the development of biological materials and the origin of life. Currently, great interest exists in the organic inventories of the icy satellites of outer planets. One source of increasing complexity in organic compounds on these icy bodies is impact driven processing. These impacts are high speed events which generate impact shocks in the many GPa range. To better understand this type of shock driven chemistry, we have undertaken a series of experiments using a two stage light gas gun to provide impacts at 5 km s⁻¹ of stainless steel projectiles onto ice targets doped with various organics. Three organics were used: β,β carotene, stearic acid and anthracene. We have analysed the organic content of the ejecta from the impacts and shown that all three organics can be found, albeit with different ejection histories (i.e. the least thermally stable compounds were preferentially found at shallow angles of ejection). Samples of ice from the impact site itself are currently under analysis and the results of this will also be presented.

Mark Burchell
Univ. of Kent

Date submitted: 19 Feb 2009

Electronic form version 1.4