

Abstract Submitted
for the SHOCK05 Meeting of
The American Physical Society

Quartz and Hydrous Iron-oxide Impactites from the Bee Bluff Structure of South Texas R.A. GRAHAM, The Tome Group, M. MARTIN, N.N. THADHANI, School of Materials Science and Engineering, Georgia Institute of Technology, Atlanta, GA 30332-0245, B. MOROSIN, Albuquerque, NM — Breccia impactite samples are found to have been strongly influenced by high pressure shock waves controlled by the thin veneer of sandstone, siltstone and a thin layer of iron-rich siltstone target rocks. Carrizo sandstone is converted to a hard grey breccia containing comminuted quartz bound with tightly adhering alpha goethite. Transformations in the hydrous iron-oxide binder and hydrous iron-rich siltstone in virtually all impactite samples dominate the scientific issues. Goethite is found in numerous samples including spherules loose on the site, 'sky bombs,' in suevite in a Rosetta Stone containing five different impactite clasts, and in samples with hydrodynamic instabilities. Localized melting in quartz at particle interfaces is observed throughout. SEM and EDX analysis shows regions of fused quartz, some in the ballen structure characteristic of lechatleriete. Acicular goethite nanocrystals and submicron spheres are abundant. The high pressure-high temperature pulse of the impact produces an environment in which transformation to the iron-rich hydrous oxide to goethite, hematite and steam is to be expected.

R.A. Graham
The Tome Group

Date submitted: 04 Apr 2005

Electronic form version 1.4