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The nature of maskelynite: a multi-technique approach.

Jaret*, S.J., and Glotch,T.D. *Stony Brook University, 255 ESS Building Stony Brook, NY 11794-2100 steven.jaret@stonybrook.edu.

During shock metamorphism, plagioclase feldspars undergo a solid-state transformation to maskelynite [1-3]. Maskelynite shows no textural evidence of melting, yet is optically isotropic. Despite considerable work on shocked plagioclase, there is still ongoing debate over internal structure of maskelynite and its formation mechanisms [4,5].

This work combines optical petrography of naturally and experimentally shocked plagioclase with micro-Raman and micro-FTIR spectroscopy. Importantly, we note a disagreement in interpretations of crystallinity depending on technique. At low shock levels, grains which exhibit no optical deformation have micro-Raman spectra suggesting partial-to-significant dissordering. At higher shock levels, grains which are optically isotropic have micro-FTIR spectra suggesting some remnant structure.

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