Shock metamorphism and 40Ar/39Ar dating of Ordinary Chondrites

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We measured cathodoluminescence (CL) of an ordinary chondrite, Etter (L4) and tried Laser Probe 40Ar/39Ar dating. Etter received shock effects of shock stage S5. A maskelynite is observed homogeneous under a microscope, however it shows inhomogeneous CL emission. CL intensity of the maskelynite inversely correlated to potassium content. We also detect infrared absorption at 3400cm-1 in maskelynite by FT-IR analysis, and this implies water molecules. We applied 40Ar/39Ar method to date the shock event possibly preserved in the maskelynite. We got 600 to 700 million years. These imply that a comet collided with L chondrite parent body at 600 to 700 million years ago.