Abstract Submitted
for the SHOCK13 Meeting of
The American Physical Society

The dehydration of potassium alum induced by shock loading HIROAKI KISHIMURA, YUHTA IMASU, HITOSHI MATSUMOTO, Department of Materials Science and Engineering, National Defense Academy — Shock-induced dehydration and structural change on potassium alum, $KAl(SO_4)_2 \cdot 12H_2O$, has been studied up to a peak pressure of 8 GPa. The shock-recovered samples have been characterized using Raman spectroscopy, x-ray diffraction (XRD), and a scanning electron microscopy (SEM). Although the sample shocked at 5 GPa are consolidated and recovered, no evidence for structural change or dehydration is obtained. However, prominent change of texture and color of the recovered sample shocked at 8 GPa is observed. The XRD results reveal that the recovered sample shocked at 8 GPa consists of anhydrous potassium alum crystals with amorphous. This structure differs from that of dehydrated alum caused by heat. The critical pressure for the shock-induced phase transition is close to the transition pressure from alum crystal to amorphous phase, which is obtained by static pressure loading.

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Date submitted: 15 Feb 2013 Electronic form version 1.4