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Recovery Studies of Shocked Iron Single Crystals¹ BASSEM EL-DASHER, WARREN MOBERLYCHAN, JAMES MCNANEY, JAMES HAWRELIAK, HECTOR LORENZANA, Lawrence Livermore National Laboratory — Time resolved, *in-situ* X-Ray diffraction measurements indicate that the bcc-hcp transition in single crystal iron occurs at about 13 GPa. These results also show that the high pressure phase is a polycrystal with two variants. Further studies on the recovered specimens using transmission electron microscopy show that these shocked samples surprisingly reverse transform from a high pressure polycrystal to the original single crystal structure upon release. These results will be discussed in the context of the time resolved data and theoretically based transformation pathways.

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