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Influence of Impurities on the Solid-Solid Phase Transitions in Zirconium[1] P.A. RIGG, C.W. GREEFF, G.T. GRAY, III, Los Alamos National Laboratory, M.D. KNUDSON, Sandia National Laboratory — In an effort to better understand the influence of impurities on the solid-solid phase transitions in Group IVb metals, experiments have been carried out in zirconium using plate impact and isentropic loading techniques. Samples with three levels of impurities were shock-loaded using both gas and powder-driven guns and isentropically loaded using magnetic drive (Sandia's Z-Machine) to determine the properties and characteristics of both the $\alpha - \omega$ and $\omega - \beta$ transitions. In addition to the transmission type experiments that were performed in the past, front surface impact experiments — where the sample is impacted directly onto a LiF window — were performed to obtain direct Hugoniot measurements in both the ω and β phases. Comparisons of all data obtained to calculations using our current Equation of State will be presented.

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