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X-Ray Ablation Rates of ICF Capsule Materials R.E. OLSON, G.A. ROCHAU, R.J. LEEPER, SNL — Accurate knowledge of the X-ray ablation rates of low-Z capsule materials will be essential for successful indirect-drive ICF ignition experiments. We have performed experiments to measure the X-ray ablation rates in Be, Cu-doped Be, high density carbon (HDC), polystyrene (CH), Ge-doped CH, and polyimide. The X-ray fluxes were supplied by hohlraums driven by the Omega Laser at the University of Rochester [1]. The measurements were made in planar geometry utilizing diagnostic techniques described in Ref. 2. Be and Cu-doped Be have been selected as the ablator materials to be used in ignition capsules at U.S. National Ignition Facility (NIF). HDC has been selected as a NIF backup ablator. The ablation rates in Be and Cu-doped Be are in the range of 3-12 mg/cm^2/ns for hohlraum radiation temperatures of 160-250 eV. The HDC ablation rates are a bit lower, in the range of 2-9 mg/cm^2/ns for temperatures of 170-260 eV. The corresponding implied ablation pressures are in the range of 40-160 Mbar for beryllium and 20-140 Mbar for HDC. Our post-shot computational simulations are mostly within the uncertainties of the ablation rate measurements. An iterative rocket model has been developed and used to relate the planar ablation rate data to convergent Omega ablation rate experiments and also to full-scale NIF ignition capsule calculations. [1] T. R. Boehly et al., Opt. Commun. 133, 496 (1997). [2] R. E. Olson et al., Phys. Plasmas 11, 2778 (2004).

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