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Absolute X-Ray Yields from Laser-Irradiated Metal-Doped Low-Density Aerogels[1] K.B. FOURNIER, J.D. COLVIN, M.J. MAY, C.M. SORCE, Lawrence Livermore National Laboratory, F. GIRARD, B. VILLETTE, Commissariat *à* l Energie Atomique, C.A. COVERDALE, Sandia National Laboratory, M. TANABE, H. NISHIMURA, Institute of Laser Engineering, Osaka University, J.F. DAVIS, DTRA — The X-ray yields from laser-irradiated, high-Z-doped, ultra-low-density aerogel plasmas have been measured in the energy range from sub-keV to 13 keV at the 20 kJ OMEGA laser. The targets' X-ray yields have been studied for variation in target size, aerogel density, laser pulse length and intensity. For Ti-doped targets that result in plasmas with electron densities in the range of ∼10% of the laser's critical density, one can expect ∼2% laser-to-X-ray conversion efficiency (CE) in the 4 - 6 keV energy band; for Zn-doped aerogels, ∼1% CE has been measured for 9 keV X rays. For Ge-doped aerogels, one can expect ∼0.7% laser-to-X-ray CE for X-rays above 9 keV, and ∼40% CE for energies below 3.5 keV. These results for doped-aerogel targets are consistent with other CE measurements made recently at the GEKKO laser for metallic Ti nano-fiber materials, and are also consistent with recent measurements of CEs for Ge-lined cavities, but are below the CEs measured for Ti-lined cavities and below the CEs measured for pre-exploded Ti foils.

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