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Spectral and radiative characterization of multi-keV X-ray sources M.A. BARRIOS, LLNL, R. EPSTEIN, LLE, K.B. FOURNIER, LLNL, S.P. REGAN, LLE, M. MAY, K. WIDMANN, O. LANDEN, H.S. PARK, B.R. MADDOX, C. HUNTINGTON, D. BRADLEY, H.A. SCOTT, G.W. COLLINS, LLNL — K-shell emission line sources were generated using laser-irradiated targets for various high-Z materials including Zn (Z=30), Ge (Z=32), Br (Z=35), Rb (Z=37), Zr (Z=40), Mo (Z=42) and Ag (Z=47). The plasma x-ray emission was spectrally characterized using temporally resolved and time-integrated x-ray spectrometers, providing absolute x-ray fluence and time-integrated K-shell emission brightness. Targets were driven with up to 60 kJ of 3ω laser light leading to irradiance on target ranging from (0.5 to 18)x10^{15} W/cm^2. The He-like resonance $1s^2$-1s2p(1P) and intercombination $1s^2$-1s2p(3P) and satellite transitions dominated the spectrum for all the elements except Ag, which emitted K-alpha light. T_e and n_e profiles from hydrodynamic simulations were used to evaluate detailed atomic models, providing comparison between calculated and absolute time-integrated measured line profiles and continuum levels. This work was performed under the auspices of the U.S. Department of Energy by LLNL under Contract DE-AC52-07NA27344.

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