

K α PRODUCTION FROM MO AND AG WIRE ARRAYS ON Z

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We have recently started exploring hot-electron-generated 2p-1s K α line emission from Mo (17.5keV) and Ag (22.1keV) wire array z-pinches on Sandia's Z generator. For both materials, spatial variations in the K α and K β lines from M- and L-shell charge states provide details on the spatial structure in the plasma and the non-Maxwellian electron distribution. The plasmas are extensively diagnosed with multiple spectrometers that provide spatially resolved coverage over a broad spectral range (0.6-22keV), allowing analysis of K-, L-, and M-shell emission for additional information on the plasma conditions. The spectroscopic data is compared to calculations with the hybrid-structure collisional-radiative code SCRAM, a statistically complete atomic model with inner-shell and multiple excitation structure for all ions of Mo from neutral to H-like that uses FAC fine-structure and UTA data supplemented by hydrogenic structure and rates. Finally we compare the relative intensities of K α emission for the two materials in both the experiment and the model, and discuss extrapolation to higher atomic numbers and hence higher photon energies.

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