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Investigation of K-shell radiation from two-component wire arrays DANIEL PAPP, VLADIMIR IVANOV, ROBERTO MANCINI, PETER HAKEL, SARA ALTEMARA, AUSTIN ANDERSON, University of Nevada, Reno — Two-component plasma was studied in star and planar wire-array Z pinches. Arrays consisted of Al wires as the first component in all shots and Ti, Cu, Ni, Mo, and Au wires as the second component. Cascading implosion in star arrays provides the mixing of wire materials in one ray during implosion. The implosion dynamic was not affected by variation of materials in wire arrays that allows observation of features of the two-component plasma. Compared to pure Al plasmas, decreased Al K-shell radiation and increased soft x-ray radiation were observed in Al-Au and Al-W plasma. Mixt plasma with 80-90% of Al ions displayed radiative properties similar to pure W or Au Z-pinch plasma. Al K-shell x-ray spectra simulations with the PrismSpect code showed a fall of the electron temperature from 400 eV in Al plasma to 250-300 eV in the Al-W and Al-Au mix. There was no corresponding cooling effect when the second component was Ti, Cu, and Ni. Spectra of the Z-pinch plasmas were compared with the spectra from laser produced Al-Au plasma experiments carried out at the Leopard laser. Work was supported by the DOE/NNSA under UNR grant DE-FC52-06NA27616.

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