Abstract Submitted
for the DAMOP06 Meeting of
The American Physical Society

$2p_{3/2}^{-1}3x^{-1}$-$3x^{-1}3d^{-1}$ X-Ray satellites in the Lα_1 region of 4d transition elements SURENDRA POONIA, Research Scientist (Atomic and X-Ray Emission Spectroscopy), Division of NRE, Central Arid Zone Research Institute, Jodhpur - 342003, Rajasthan, India — The X-ray satellite spectra arising due to $2p_{3/2}^{-1}3x^{-1}$-$3x^{-1}3d^{-1}$ (x $\equiv$ s, p, d) transition array, in elements with Z = 40 to 48, have been calculated, using available Hartree-Fock-Slater (HFS) data on $1s^{-1}$-$2p^{-1}3x^{-1}$ and $2p_{3/2}^{-1}$-$3x^{-1}$,$3x'^{-1}$ Auger transition energies. The relative intensities of all the possible transitions have been estimated by considering cross - sections for the Auger transitions simultaneous to a hole creation and then distributing statistically the total cross sections for initial two hole states $2p_{3/2}^{-1}3x^{-1}$ amongst various allowed transitions from these initial states to $3x^{-1}3d^{-1}$ final states by Coster-Kronig (CK) and shake off processes. In both these processes initial single hole creation is the prime phenomenon. Each transition has been assumed to give rise to a Gaussian line and the overall spectrum has been computed as the sum of these Gaussian curves. The calculated spectra have been compared with the measured satellite energies in Lα_1 spectra. Their intense peaks have been identified as the observed satellite lines. The peaks in the theoretical satellite spectra were identified as the experimentally reported satellites α_3, α_4 and α_5, which lie on the high-energy side of the Lα_1 dipole line.

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Date submitted: 25 Jan 2006 Electronic form version 1.4