Photoionization and Electron-Ion Recombination: Fe XVII, S XIV AND S XV Using Unified Method[1] SULTANA NAHAR, The Ohio State U — New results on photoionization and electron-ion recombination from unified method for Fe XVII, S XIV, and S XV will be reported. The unified method, based on close-coupling approximation and R-matrix method, (i) subsumes both the radiative and dielectronic recombinations and (ii) provides self-consistent sets of photoionization and recombination cross sections, σ_{PI} and σ_{RC}. Important features will be illustrated for level-specific total and partial photoionization cross sections, total and level-specific recombination rate coefficients, such as of diagnostic w, x, y, z X-ray lines of S XV and ultraviolet lines of S XIV observed in astrophysical spectra. Results are obtained for the first time for fine structure levels with $n \leq 10$ and $0 \leq l \leq 9$ which are 98 levels of S XIV of total angular momenta $1/2 \leq J \leq 17/2$ and 188 levels of S XV of $0 \leq J \leq 10$. Total recombination rates agree well with the available rates. σ_{PI} of Fe XVII for hundreds of fine structure levels being calculated using relativistic Breit-Pauli R-matrix method will also be reported. The wavefunction includes ground and 59 core excitations of n=2 and 3 complexes. Impact of n=3 core excitations will be illustrated.

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