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Low Energy Charge Exchange Using the Upgraded ORNL Ion-Atom Merged-Beams Apparatus¹ CHARLES HAVENER, RIAD REJOUB, Oak Ridge National Laboratory — The Oak Ridge National Laboratory (ORNL) Ion-Atom Merged-Beams Apparatus is used to measure absolute charge exchange cross sections for multicharged-ions on neutral atoms from keV/u down to meV/u collision energies. The apparatus has recently been upgraded and moved to accept beams from an all-permanent magnet ECR ion source mounted on a 20-250 kV High Voltage platform. Upgrades include a dual rotating-wire scanner which provides more accurate beam profiles and a shortened merge-path to increase the angular acceptance of the apparatus. A high transmission beam line from the HV platform and spherical sector electrostatic mergers provide an observed factor of four decrease in the angular divergence of the ion beam. This translates into a significant improvement in the collision energy uncertainty and allows access to lower energies with higher resolution. The higher velocity ion beams permit charge exchange measurements with heavier ions and measurements with both H and D at eV/u energies and below to directly observe the isotope effect. Measurements with $N^{2+} + H$ are in progress and are compared to previous measurements with D.

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