In this Compton scattering experiment, conducted by the nuclear physics group at MAX-lab in Lund, Sweden, tagged photons of energy $E_\gamma = 81.5 – 115.7$ MeV were incident on a carbon target. Photons were produced via bremsstrahlung created by an electron beam's interaction with an aluminum radiator. The electrons' flight was deflected by a magnetic field into plastic scintillator paddles along the focal plane, allowing the corresponding photons' energies to be tagged. Photons scattered from the carbon target were then detected by three large volume (50 cm × 50 cm) NaI scintillator detectors located at 60°, 120° and 150° from the photon beam's axis. The elastic Compton scattering peak was identified by setting a time window on “true” coincidences between the NaI detectors and the tagger focal plane array. The collected data required a background subtraction to remove the unwanted contribution to the energy spectra of “random” events such as cosmic rays and untagged photons. After this subtraction, the residual background was fit in order to determine the integral of the elastic scattering peak. With this experimental yield, normalization factors such as the target thickness, the photon flux, and the NaI detector solid angles were applied to determine the absolute cross sections. The results are presented as a function of angle and energy, and are compared to published values from the literature.