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Double core-hole electron spectroscopy of formamide STEVE SOUTHWORTH, GILLES DOUMY, DIPANWITA RAY, ELLIOT KANTER, BERTOLD KRAESSIG, YUELIN LI, LINDA YOUNG, Argonne National Laboratory, JOCHEN KUEPPER, CFEL, DESY and University of Hamburg, JOHN BOZEK, CHRISTOPH BOSTEDT, MARC MESSERSCHMIDT, LCLS, SLAC National Accelerator Laboratory, NORA BERRAH, LI FANG, BRENDAN MURPHY, TIMUR OSIPOV, Western Michigan University, JAMES CRYAN, JAMES GLOWNIA, SHAMBHU GHIMIRE, PULSE, SLAC National Accelerator Laboratory, NIKOLAI KRYZHEVOI, LORENZ CEDERBAUM, University of Heidelberg, ROBIN SANTRA, CFEL, DESY and University of Hamburg — The intense, femtosecond x-ray pulses generated at the Linac Coherent Light Source can produce double core-holes (DCH) by absorbing two photons sequentially prior to Auger decay [1,2]. DCH binding energies at different atomic sites are sensitive to the chemical environment and electron correlations. DCH features appear in photoelectron and Auger electron spectra. At the LCLS, we used 1000 - 1200 eV x-rays with estimated pulse durations < 10 fs to record electron spectra of formamide, HCONH_2 . The measured electron spectra are compared with calculated DCH binding energies at the C, O, and N sites of the molecule. [1] R. Santra *et al.*, Phys. Rev. Lett. **103**, 013002 (2009). [2] L. Fang *et al.*, Phys. Rev. Lett. **105**, 083005 (2010).

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