ULTRAFAST XUV ABSORPTION SPECTROSCOPY OF ORGANIC HALIDES

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Extreme ultraviolet (XUV) absorption spectroscopy, paired with few-femtosecond temporal resolution, offers a unique capacity to studying the driving mechanics of fundamental chemical systems such as ionization, fragmentation, and relaxation. The generation of XUV light using high harmonic generation in a table-top setting provides the ability to observe transitions from localized core shells to delocalized valence shells to glean information about their larger molecular systems (e.g. oxidation state, spin state, magnetic quantum number, and local bonding environment). Organic halides (R-F, Cl, Br, I) are both naturally occurring and synthetic molecules used in widely in industries such as drug delivery and crop production. The use of heavier halogens (bromine and iodine) make them ideal molecules for studying electronic and vibrational dynamics of small organics using XUV absorption spectroscopy as their core-valence transitions are accessible with XUV spectrometer. This presentation will cover both experimental and computational results of few-femtosecond dynamics in organic halides and how these results inform larger processes.