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## XUV and X-ray spectroscopy of phthalocyanines in the gas-phase

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Phthalocyanine are synthetic molecules closely related to the natural porphyrines. Thanks to their rich photo-physics and photochemistry, they show promising potential in a wealth of applications, including biology or medicine. We are particularly interested in transition-metal containing molecules and, more precisely, to the interaction between 3d orbitals of the metal and its surrounding N 2p orbitals. The strong mixing between the metal and ligand's orbitals is known to enhance intramolecular charge transfer when photoexcited with visible light. Through a series of gas-phase synchrotron radiation-based experiments at the french synchrotron SOLEIL, we will show that this interaction can be probed locally at the metal or at the nitrogen site through multi-threshold electron spectroscopy, combined with several level of theory to simulate our spectra. Furthermore, we highlighted intriguing electronic processes such as interatomic Coulombic decay-like mechanisms, where the metal can participate to the relaxation of a core-hole in the ligand, or Fano-type interferences between resonant and non-resonant pathways to the same ionized state.

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