MaMaSELF

Contribution ID: **27** Type: **Student contribution**

XAS and EXAFS of dioxygen binding to binuclear copper complexes.

Tyrosinase is an essential enzyme in many organisms, including humans. Its ability to oxidize molecules by utilizing molecular oxygen is commonly applied in nature for the synthesis of melanin, a pigment which has many protective properties. Being highly efficient and selective, the reaction could also have interesting industrial applications. However, the exact geometric structure of the binuclear copper site in the active center during oxygen binding, and therefore the mechanism of the reaction, is not fully understood yet, as experimental and theoretical structure determinations have not been conclusive. In the course of this work, X-ray absorption measurements (XAS) have been conducted with model complexes for tyrosinase to try and understand the structure of the intermediate and the reaction mechanism. As the active site of the enzyme is the binuclear copper complex, the fine structure of the copper K-edge (EXAFS) can selectively be analyzed to derive the interatomic distances during oxygen binding. The data obtained and processed to this point will be presented and discussed in the oral presentation.

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Session Classification: Student session

Track Classification: Student contribution