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Identifying structural characteristics of reassembled protein nanoparticles.

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Keywards : Fe, Cu, XANES, EXAFS

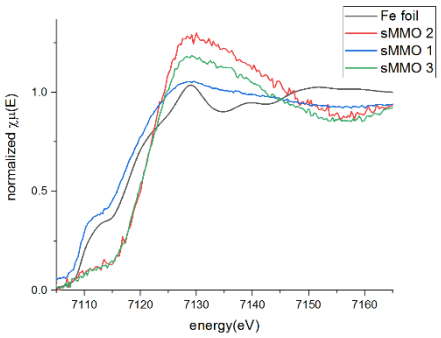
1. Introduction

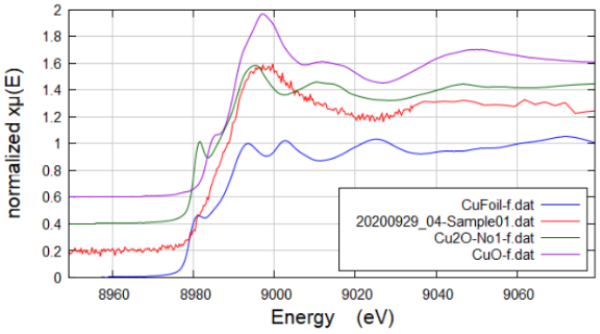
Native MMO is an industrially promising enzyme owing to its significant potential impact on the future of industrial biomanufacturing. Despite potential importance, the low cell productivity and low MMO yield of methanotrophs has been a major obstacle for the research. To overcome this obstacle, we attempted a molecular design for structural and functional mimicry of pMMO and eventually succeed in high-yield synthesis of a catalytically active, novel sMMO and cMMO particles in *E. coli.* In this work, we are trying to confirm the nuclearity of Fe and Cu ions of the synthesized sMMO and cMMO

2. Experiments

sMMO-1,sMMO-2,sMMO-3 and cMMO were prepared as a freeze-dried powders. These samples were analyzed at the Aichi Synchrotron center in order to confrim the nuclearity of Fe and Cu ions in the synthesized sMMOs and cMMO. The collected XANES and EXAFS data were analyzed by using *Athena* software.

3. Results & Discussion





The absorption peaks of XANES spectra of sMMO-1, sMMO-2, sMMO-3 in Figures for sMMO show a little difference. The signal intensities of the experimental data are not so good because the concentrations of Fe and Cu ions are not sufficient for the experiment. It is needed for us the more XANES experiment to analysis the exact nuclearity of Fe ions in sMMO particles. And cMMO is appeared at the same absorption energies compared with our last experimental sample pMMO.

4. References

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2. Lieberman, et al., *Inorg Chem*. (2006), 45(20): 8372–8381