Site-Selective EXAFS in Fe-Only Hydrogenase Model Compounds Using High-Resolution Fluorescence Spectroscopy

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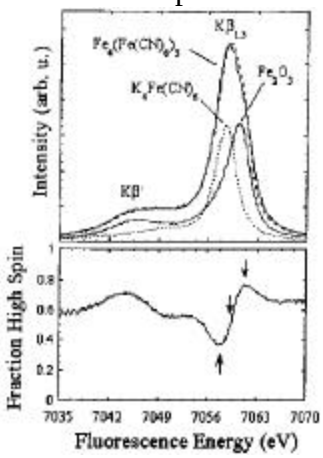
Hydrogenases are enzymes that catalyse the reversible two-electron oxidation of H_2 in aerobic and anaerobic micro-organisms[1]. There are three classes of hydrogenases: [NiFe] hydrogenases, [Fe]-only hydrogenases and metal free hydrogenases. Our studies are focused on [Fe]-only hydrogenases, which contain an Fe dimer active site. Although extensive studies on structure have been made, the details on the whole remain unsolved. Site-selective EXAFS using high-resolution fluorescence spectroscopy is a relatively new technique. The Kß fluorescence lines arising from the high-spin and low-spin iron sites are shifted in energy, thus we can record fluorescence-detected absorption spectra of different iron sites in the enzyme using different emission energies[2]. From there, more detailed structure information of the enzyme active site can be obtained. In this work, the results on [Fe]-only hydrogenase model compounds will be presented.



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