EXAFS Study of Myoglobin in Solution and in Crystalline Form

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The extended x-ray absorption fine structure (EXAFS) of myoglobin (mb) near the Fe K-edge was measured with synchrotron radiation (SLAC Stanford). A comparison was made between the aquo-met form of mb (sperm whale) in solution and in crystalline form. A solution of ca. 15 mM mb and single crystals of mb were used for this investigation. The analysis of the EXAFS data was performed as described in the references: The fluorescence data were Fourier-filtered to obtain the average distance of the first shell of ligands of the Fe. The unknown phase function of mb was determined empirically from the model system bis-imidazole-hemin. An average Fe-nearest neighbour distance of 2.045 $\pm$ 0.02 Å for mb in solution and of 2.035 $\pm$ 0.02 Å for mb in crystalline form was evaluated. Within the experimental accuracy these average distances are the same.

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