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Catalase-Peroxidase from *Streptomyces seoulensis*

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Catalase-peroxidase was purified to near homogeneity from *Streptomyces seoulensis*. The enzyme was composed of two subunits with a molecular mass of 78 kDa and contained 1.05 mol of protoporphyrin IX per mol of dimeric protein. The absorption and resonance Raman spectra of the native and its cyano-enzyme were closely similar to those of other heme proteins with a histidine as the fifth ligand. However, the peak from tyrosine ring at ~1612 cm^{-1}, which is unique in catalases, was not found in resonance Raman spectra of catalase-peroxidase. The electron paramagnetic resonance spectrum of the native enzyme revealed uniquely two sets of rhombic signals, which were converted to a single high-spin, hexacoordinate species after the addition of sodium formate. Cyanide bound to the sixth coordination position of the heme iron, thereby converting the enzyme to a low-spin, hexacoordinate species. The time-dependent inactivation of the enzyme with diethyl pyrocarbonate and its kinetic analysis strongly suggested the occurrence of histidine residue. From the above-mentioned spectroscopic results and chemical modification it was deduced that the native enzyme is predominantly in the high-spin, ferric form and has a histidine as the fifth ligand.

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Medium Chain Length Poly(3-hydroxyalkanoate)s: Preparation and Application

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Pseudomonas oleovorans and *P. putida* are well known to produce medium chain length poly(3-hydroxyalkanoate)s, mcl-PHAs, bearing functional groups such as halogens, CN and aryloxy groups. None of mcl-PHAs have been commercialized due to the high cost for production and poor properties. One of research objectives in our laboratories is to develop PHAs that have properties good enough for practical applications. PHAs bearing methylphenoxy groups and PHAs bearing carbon-carbon triple bonds were newly prepared. PHAs bearing methylphenoxy groups were crystalline and had higher glass transition temperatures. The unsaturated groups can be easily modified to yield polymers that are expected to have improved properties or polymers that have special functions.