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Copper (II) Chelates of an Intermediate Species Absorbing in the 500-nm Region*

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A key step in the action of almost all pyridoxal enzymes is thought to be the formation of a quinoid structure, in which the α -carbon of the pyridoxylideneamino acid (aldimine) is deprotonated. Several enzymes have been reported to exhibit an intense absorption band in the 500-nm region of the spectrum on addition of substrate or pseudosubstrate. This absorption has been ascribed to the quinoid intermediate. We previously observed an intermediate species absorbing at 488 nm in Al(III) chelate mediated nonenzymatic reaction between a ketimine from ethyl pyruvate and pyridoxamine and an aldimine from ethyl alaninate and pyridoxal. It was identified as the quinoid intermediate. Other trivalent ions of the aluminum subgroup (Ga, In) and of most lanthanide produced similar intermediates. It has been believed that divalent ions such as Cu(II) do not form the species in the reaction.

Our recent study showed that an intermediate absorbing in the 500-nm region was formed in a nonenzymatic transamination of pyridoxal and amino acid ester catalyzed by the Cu(II) chelate of dipyridyl or tripyridyl or related ligands. The absorption was ascribed to the ternary complex of Cu(II)-quinoid-ligand. The quinoid species may be stabilized in a six-coordinated ternary Cu(II) complex.

* 本報告は“*Biochemistry of Vitamin B₆*” ed. by T.Korpela and P.Christen, Birkhäuser, Basel, 1987, pp. 367-370 に発表.