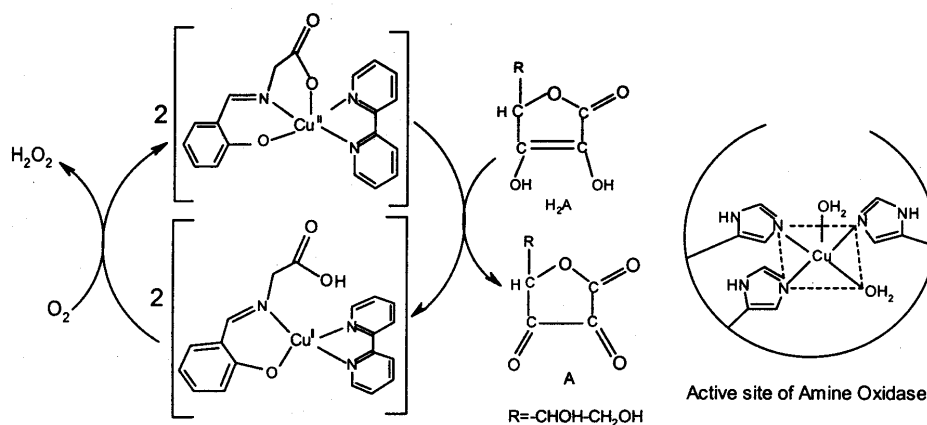


A copper complex (2,2'-bipyridine)(salicyclideneglycinato) copper(II) as a model for the active site structure of amine oxidase

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Copper-containing amine oxidases are one of the most widely distributed classes of type 2 copper enzymes^{1,2}. They catalyse the oxidative deamination of primary amines: $RCH_2NH_2 + O_2 + H_2O \rightarrow RCHO + H_2O_2 + NH_3$. Based on spectroscopic studies, the active site of amine oxidase in its oxidised form is postulated to have one Cu^{II} site coordinated to 3 histidine residues in the equatorial position and two water molecules giving a CuN_3O_2 coordination sphere. In this paper, we report a copper(II) complex having a CuN_3O_2 coordination geometry which is found to be catalytically active in oxidising ascorbic acid in air. In aqueous-methanol, ascorbic acid reduces the copper(II) complex to form a brown copper(I) species which readily converts to the green precursor copper(II) complex in the presence of dioxygen. The proposed catalytic cycle for this conversion in air is shown below. The copper(II) complex is also catalytically active in the oxidation of benzylamine as an organic substrate. This mimics the functional property of amine oxidase.



References

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