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研究简报

直链醇对反胶束体系中木素过氧化物酶催化活性的影响

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摘要 根据研究发现, 在有醇作助表面活性剂的CTAB反胶束中木素过氧化物酶(LiP)不能表现活力, 而在水介质中CTAB对LiP的催化活性影响又不是很大. 为了揭示其中醇的影响, 本工作就不同碳链长度的醇对LiP酶催化性能的影响进行了研究. 由于CTAB反胶束体系中醇浓度较高, 且碳原子数大于4的直链醇在水中的溶解度又很小, 为此采用了LiP可在其中显示催化活性的CTAB正胶束、AOT反胶束和Brij30反胶束作介质, 通过研究这些介质中不同链长的醇对LiP催化活力的影响, 来探讨CTAB反胶束中木素过氧化物酶(LiP)不能表现活力的原因. 结果表明, 不管表面活性剂聚集体的结构、电性质及反胶束大小如何, 只要醇的浓度超过500 mmol•L^{-1} (丁醇≥1200 mmol•L^{-1}), LiP在上述原本可显示活力的介质中均无催化活性. 据此推测CTAB反胶束中木素过氧化物酶(LiP)不能表现活力的原因主要是由助表面活性剂醇造成的.

关键词 木素过氧化物酶(LiP) 直链醇 反胶束 催化活性

分类号

Effects of Normal Alcohols on the Catalytic Activity of Lignin Peroxidase in Reversed Micelles

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Abstract Previous studies indicated that lignin peroxidase **(**LiP) hosted at CTAB/*n*-alcohol/isooctane/water reversed micelle did not show any catalytic activity, but in normal micellar solution of CTAB, LiP could express its catalytic activity. To reveal the role of normal alcohol, the effects of the alcohol with different carbon chain length on the catalytic activity of LiP were investigated. Because the content of the alcohol in the CTAB reversed micellar medium was high and the normal alcohols with the number of carbon atoms higher than 4 were slightly soluble in water, three media in which LiP could express its catalytic activity, *i.e.*, a CTAB normal micellar medium, an AOT reversed micellar medium, and a Brij 30 reversed micellar medium, were used to study the effect of normal alcohols on the catalytic activity of LiP. Results indicated that as long as the concentration of the alcohol exceeded 500 mmol•L^{-1} (≥1200 mmol•L^{-1} for butanol), LiP lost its activity completely in the three media above regardless of the structure, the electrical property and the size of the surfactant aggregates. Consequently it was deduced that the phenomenon that LiP hosted at CTAB reversed micelles could not express its activity was mainly due to the alcohol co-surfactant.

Key words lignin peroxidase normal alcohol reversed micelle catalytic activity

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