

研究论文

古细菌 *Aeropyrum pernix* K1 超嗜热酯酶 APE1547 的稳定性

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摘要 研究了纯化的超嗜热酯酶 APE1547 的稳定性. 结果表明, 该酶的稳定性非常好, 蛋白的质量浓度为 0.4 mg/mL 时, 90 °C 的半衰期为 20 h, 0.2 mg/mL 时的半衰期为 12 h; 而蛋白的质量浓度为 0.04 mg/mL 时, 保温 2.5 h 时残余活力仍在 50% 以上. 同时还研究了热变性时该酶表面疏水氨基酸的变化. 该酶的 pH 稳定性也很好, pH 在 6.5-9.0 范围内作用 24 h, 酶依然很稳定, 残余酶活力大于 93%; 同时该酶还具有很强的耐有机溶剂的特性.

关键词 [古细菌](#) [超嗜热酯酶](#) [热稳定性](#) [Aeropyrum pernix K1](#)

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Stability of a Hyperthermophilic Esterase APE1547 from an Archaeon *Aeropyrum pernix* K1

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Abstract The gene APE1547 from an archaeon *Aeropyrum pernix* K1 were cloned and expressed in *E. coli* BL21. The recombinant enzyme shows an esterase activity and its optimum reaction temperature was 90 °C. In this paper, the stability of a hyperthermophilic esterase APE1547 from an archaeon *Aeropyrum pernix* K1 was studied. The experimental results indicate that APE1547 was one of the most stable hyperthermophilic enzymes. Its half-life was 20 h at 90 °C (0.4 mg/mL), and it was stable in an alkaline environment. At the same time, the change of the fluorescence and the activity was detected when the enzyme was thermally denatured. With the exposure of hydrophobic amino acids, its activity reduced gradually. Furthermore, this enzyme has a good pH stability and shows a good organic solvents resistance. The present results indicate that this enzyme will be useful in specific industry process such as high temperature or organic reaction.

Key words [Archaeon](#) [Hyperthermophilic esterase](#) [Thermostability](#) [Aeropyrum pernix K1](#)

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