عنوان مقاله:

Converting protein splicing enzyme to catalyze C-C bond formation reactions

محل انتشار:

پنجمین کنفرانس بین المللی پژوهش کاربردی در شیمی و مهندسی شیمی با تاکید بر فناوری های بومی ایران (سال: 1397)

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خلاصه مقاله:

Biocatalysts can catalyze the reaction between molecular substrates, particularly a substrate not known to be transformed by that enzyme in natural systems. Biocatalysis is becoming a favorable alternative to chemical processes and an essential part of green chemistry. Using enzymes as catalysts offer many advantages in comparison with classical chemical catalysts, including reducing the risk of side reactions, working under mild temperature and pH, having high substrate specificity, regioselectivity, and stereoselectivity, and minimizingenvironmental risks. One of the important enzymes in biotechnology is protein splicing enzymes (inteins). Inteins are protein splicing segments that employ standard enzyme strategies to excise themselves from precursor proteins and join the remaining sequences (exteins). In the present work, protein splicing gene was cloned into the expression plasmid and then for further investigation on the activity of the enzyme the recombinant enzyme transformed into the BL21. After solubilization and refolding the enzyme its applicationon carbon-carbon bond formation reactions, known as the Mannich reaction was investigated. Surprisingly, the resulting enzyme was able to perform organic reactions related to the C-C bond formation. Cloning and expression of splicing enzyme were confirmed by gel electrophoresis, and synthesis of mannich bases and other products of the reactions were determined by 1H and 13C NMR spectroscopy and by comparison with known compounds reported in the literature

کلمات کلیدی:

biocatalysis, carbon-carbon bond formation, protein splicing enzyme