

## Effect of light irradiation on esterification of oleic acid with ethanol catalyzed by immobilized *Pseudomonas cepacia* lipase

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### ABSTRACT

The present study demonstrates the effect of light irradiation on the esterification of oleic acid catalyzed by immobilized *Pseudomonas cepacia* lipase. The reaction rates of all the experiments under light irradiation were found to be higher than dark conditions. The kinetics of reactions supported the Ping-Pong Bi-Bi mechanism with dead end inhibition by both the alcohol and acid substrates. Moreover, circular dichroism (CD) spectroscopy was used to analyze the effect of light on lipase enzyme. The CD spectroscopic studies confirmed that the conformational changes in the secondary structure of the lipase enzyme increased the reaction rate of light-illuminated experiments, which might have opened up the active sites of enzymes and thus, resulted in higher reaction rates compared to dark reactions. These results have successfully demonstrated that the light illumination positively influenced the rate of *P. cepacia* enzyme-catalyzed esterification reactions.

### KEYWORDS

Esterification; Light irradiation; Oleic acid; Ping-Pong Bi-Bi mechanism; *Pseudomonas cepacia*

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