

Title : Immobilization of castor plant peroxidase by polyethylene glycol

Author(s) : 1. Ms. Neatima Supata

Student ID : 640510046

Major : Biochemistry and Biochemical Innovation

Advisor(s) : 1. Associate Professor Dr. Lalida Shank

Type of presentation* (choose 1) : Oral Presentation (เฉพาะ ตัวแทนศ.ที่สาขาเลือกให้นำเสนอแบบบรรยาย)
 Poster (กรณี นำเสนอผลงานปัญหาพิเศษ/การค้นคว้าอิสระ)
 Cooperative Education (กรณี นำเสนอผลงานสหกิจศึกษา)

ABSTRACT

Peroxidase is an enzyme in the oxido-reductase group that catalyzes the oxidation reaction of various substrates, both organic and inorganic, with hydrogen peroxide as the electron acceptor. Immobilization of this enzyme helps save the cost by being able to reuse it for catalysis in bioremediation and biotechnological applications. The objectives of this study were to Immobilize peroxidase from castor bean leaves using polyethylene glycol (PEG) and sodium sulfate at different weight per weight percentages via aqueous two-phase systems, and to investigate the effect of pH on phase partitioning. Peroxidase activity was determined using guaiacol and hydrogen peroxide as substrates at pH 6. The upper PEG layer which was our phase of interest under five conditions resulted in the corresponding activity for each as follows: (1) 14% PEG 1500 with 12% sodium sulfate (1.02 units), (2) 18% PEG 1500 with 8% sodium sulfate (1.21 units), (3) 18% PEG 1500 with 10% sodium sulfate, (3.22 units), (4) 18% PEG 1500 with 12% sodium sulfate (2.03 units). and (5) 18% PEG 6000 with 12% sodium sulfate (0.96 units). Among these, 18% PEG 1500 with 10% sodium sulfate demonstrated the highest enzymatic activity in the upper phase with specific activity of 38.08 units/mg of protein. Further studies were conducted at pH 8 and pH 10 to determine the effect of higher pHs on this condition which resulted in specific activity of 0.26 units/mg of protein and 0.15 units/mg of protein, respectively. In the next step, additional investigation will be carried out on the effect of lower pHs on this combination.

*Type of presentation must be matched with an option you choosing on student upload system.

**The abstract can be more than one page and must be approved by project advisor before upload.