

Two Simple Methods to Attach Magnetic Particles on Commercial Lipase Acrylic Resin from *Candida Antarctica* and its Application toward the Transesterification Reaction of Soybean Oil

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Magnetic lipase was synthesized using two simple methods, and the one using water-based pre-synthesis method seems more stable and have higher activity. When IPA was added as solvent, we find that the FAME yield rises and soybean oil conversion also increases due to the formation of IPA esters. 0.750 ml IPA were added instead of 0.048 ml because a higher total ester amount will be better than a higher FAME amount only. We could still obtain about 45% of FAME yield as well as a high IPA ester amount although the magnetic nanoparticles may somehow decrease the lipase activity.

This modified commercial lipase allowed us to recycle the enzymes by magnetism, which makes it easier to be separated with the other residues. Also, by recycling these commercial immobilized enzymes, the high cost of purchasing lipase could be balanced and may be much more realizable to apply in industry.

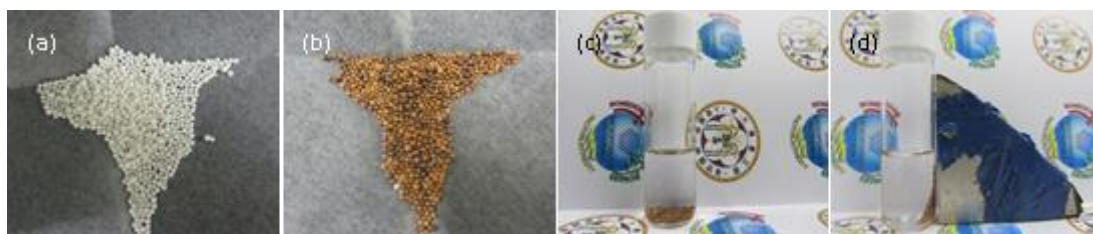


Figure 1. (a) The commercial lipase acrylic resin from *Candida Antarctica* and (b) lipase after the Fe_3O_4 NPs were added on its surface. (c) The magnetic commercial lipase in isopropanol before and (d) after the magnet was put beside the vial.

Keywords: lipase, iron oxide, biodiesel, magnetism, transesterification

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