Lipase-catalyzed esterification of betulinic acid using phthalic anhydride in organic solvent media: study of reaction parameters

ABSTRACT

The lipase from Candida antarctica immobilized on an acrylic resin (Novozym 435) was employed for the catalytic reaction of betulinic acid and phthalic anhydride. The influence of different reaction parameters, such as effect of single and mixed solvents, substrate molar ratio, reaction time, temperature, amount of enzyme, effect of inorganic bases and effect of substrate support were investigated and optimized. Optimum conditions to produce 3-O-phthalyl- betulinic acid were observed at reaction time; 24 h, temperature; 55ï¿½C, amount of enzyme; 176mg, substrate molar ratio (betulinic acid: phthalic anhydride, 1:1), inorganic base of K2CO3, amount of celite; 170 mg in 1:1 mixture of chloroform and n-hexane as solvent. At optimum conditions, it gave 61.8% of 3-O-phthalyl- betulinic acid.

Keyword: Betulinic acid; Phthalic anhydride; Novozyme 435; Betulinic acid ester