STUDY ON LIPASE-CATALYZED HEXYL ACETATE IN SUPERCRITICAL CARBON DIOXIDE

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ABSTRACT

FLAVORING MATERIALS WIDELY USED IN THE FOOD,BEVERAGE,COSMETIC,AND PHARMACEUTICAL INDUSTR -IES.AT PRESENT, FLAVORING MATERIALS FOR CHEMICAL SYNTHESIS ARE COMMERCIALLY AVAILABLE.WHE -N ESTERS ARE PRODUCED CHEMICALLY,IT HAS SEVERAL DRAWBACKS (E.G.,LOW YIELD,BYPRODUCTS) DUE TO HIGH REACTION TEMPERATURE AND HIGH PRESSURE.LIPASE-CATALYZED REACTIONS OFFER SEVERAL AD -VANTAGES OVER CHEMICALLY CATALYZED REACTIONS,SUCH AS MILDER OPERATING CONDITIONS,REDUCED COST,AND EASILY SEPARATED AND PURIFIED PRODUCT. THE ABILITY FOR LIPASE (LIPOZYME IM-77) FROM RHIZOMUCOR MIEHEI TO CATALYZE THE TRANSESTE -RIFICATION OF TRIACETIN WITH HEXANOL WAS STUDIED IN SUPERCRITICAL CARBON DIOXIDE.FIRST, THE EFFECT OF REACTION TIME,TEMPERATURE,PRESSURE ON THE YIELD OF HEXYL ACETATE WAS INVEST -IGATED.SECOND,RESPONSE SURFACE METHODOLOGY (RSM) AND 3-LEVEL-3-FACTOR FRACTIONAL FACTORI -AL EXPERIMENTAL DESIGN WERE EMPLOYED TO EVALUATE THE EFFECTS OF SYNTHESIS VARIABLES,SUCH AS REACTION TIME (30 TO 90 MIN),TEMPERATURE (35 TO 55 oC),PRESSURE (1500 TO 3500 PSI) ON PERCENTAGE MOLAR CONVERSION OF HEXYL ACETATE AND OBTAIN THE OPTIMUM CONDITIONS. THE RESULTS SHOWED THAT TIME AND PRESSURE WERE EFFECTS ON PERCENT MOLAR CONVERSION OF HEXYL ACETATE.THE OPTIMUM MOLAR CONVERSION OF HEXYL ACETATE WAS 75.56 %.

Keywords : HEXYL ACETATE,SUPERCRITICAL CARBON DIOXIDE TRANSESTERIFICATION,RESPONSE SURFACE METHODOLOG -Y, FRACTIONAL FACTORIAL EXPERIMENTAL DESIGN.

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