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甘油酯化降酸反应过程研究

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Study of esterification of acid oil with glycerol

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摘要 研究了酸化油甘油酯化反应降低酸值的反应过程，考察了温度、甘油与酸化油中游离脂肪酸物质的量比和单甘酯含量对反应的影响，发现甘油单甘酯能明显促进酯化反应的进行。对二元体系甘油三酯-甘油、油酸-甘油和单甘酯-甘油的液-液相平衡以及甘油-单甘酯-油酸三元体系液-液相平衡的分析结果表明，甘油单甘酯的存在能够显著提高甘油与脂肪酸的相互溶解。这较好地解释了甘油单甘酯在酸化油酯化反应中的促进作用。

关键词： 酸化油　甘油　酯化反应　甘油单酯　液-液相平衡

Abstract： The esterification process of acidified oil with glycerol was thoroughly investigated by varying reaction temperature, molar ratio of glycerol to the free fatty acids in oil and the monoglyceride content in starting materials. It is found that monoglyceride can significantly promote the reaction process and lead to a much lower content of fatty acids in the product. This is elucidated by the additional analysis of experimental liquid-liquid equilibrium data for the binary systems of triglycerides-glycerin, oleic acid-glycerol and monoglyceride-glycerol, as well as the ternary phase diagram of glycerol-monoglyceride-oleic acid system. The comparison between the above ternary and binary systems clearly indicates that the appearance of monoglyceride remarkably improves the solubility of both glycerol and fatty acids in its counter phase, which can account for the observed promotion effect of monoglyceride in the esterification process of acidified oil.

Key words： acidified oil　glycerol　esterification reaction　monoglyceride　liquid-liquid phase equilibrium

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