牡丹籽油超临界二氧化碳萃取工艺　Supercritical Carbon Dioxide Extraction of Paeonia suffruticosa Andr. Seed Oil

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关键词：　　牡丹籽油 超临界二氧化碳萃取 中心复合设计 响应面分析

摘　要：　　以牡丹籽为原料，利用超临界CO_2萃取提取牡丹籽油。采用单因素试验对影响牡丹籽油得率的5个影响因素（筛分粒度、CO_2流量、压力、温度和时间）进行考察。以油得率为响应目标，对3个主要影响因素（筛分粒度、压力和温度）运用中心复合设计法，并经响应面法优化分析得到二次多项式回归方程预测模型，确定了超临界CO_2萃取牡丹籽油的最佳条件为：筛分粒度60目，CO_2流量20L/h，压力35MPa，温度45℃，时间120min。在较优提取条件下，牡丹籽油得率可达到24.22%。GC-MS结果表明牡丹籽油中富含不饱和脂肪酸，其中亚油酸和亚麻酸的含量分别为23.4%和66.85%。　Based on the single factor test, the effects of particle size, SC CO 2 flow rate, pressure, and temperature, extraction time on oil extraction yield were investigated. As a result, three independent variables, such as particle size, pressure, and temperature, have significant effects on the oil yield. A three-factor and five-level second-order regression for central composite experimental design was employed to study the response, and the interaction of the factors on the oil yield was also investigated. By the analysis of response surface, a polynomial regression equation was obtained, to gain the optimal conditions of SC CO2 extraction followed as, particle size of 60 mesh, CO2 flow rate of 20L/h, extraction pressure of 35MPa, temperature of 45℃, and time of 120min. In the aboved condition, the experimental yield of the Paeonia suffruticosa Andr. seed oil is 24.22%. GC-MS analysis shows that the extracted oil is abundant in unsaturated fatty acid with the majority of the components as linoleic acid (23.34%) and linolenic acid (66.85%).

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