

超临界CO₂连续浓缩鱼油EPA和DHA的研究

Continuous concentration of EPA and DHA from fish oil by supercritical CO₂

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英文关键词: supercritical CO₂ extraction; packed-tower; continuous concentration; fish oil; EPA; DHA

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中文摘要:

为了克服鱼油有效组分超临界CO₂间歇萃取方法的缺点,设计建造了超临界CO₂在内径14 mm、填料高1.8 m的填料塔中连续萃取浓缩鱼油有效组分的流程。根据单因素试验的结果,对工艺参数进行优化。设计了4因素3水平并考虑部分交互作用的正交试验方案,以综合指标进行评价,得到了优化工艺参数为:填料塔压为12.5 MPa; CO₂流量为5 L/min; 鱼油进料流量为0.8 mL/min; 塔的温度分布为40~85℃。经方差分析得知,温度分布的影响对综合指标高度显著,鱼油进料流量对综合指标的影响显著,试验范围内的压力、CO₂流量、压力和温度分布交互作用、温度分布和CO₂流量交互作用以及压力和CO₂流量交互作用对综合指标没有显著影响。

英文摘要:

In order to overcome the disadvantages of a batch flow, a continuous flow was designed to concentrate EPA and DHA from fish oil by supercritical CO₂ extraction technology in packed-tower with a diameter of 14 mm and a padding height of 1.8 m. Then, on the basis of single-factor experiments, the technological parameters were optimized by orthogonal tests which include 3 factors and 4 levels, with the consideration of interaction among 3 factors, in which a comprehensive index was used as a test target. The results showed that the optimum column pressure was 12.5 MPa, temperature distribution was 40~85℃, CO₂ flow 5 L/min, and fish oil feed flow was 0.8 mL/min. It was found that the temperature distribution factor was very prominent, followed by the factor of fish oil feed flow. The effects of pressure and CO₂ flow, as well as the interactive effects among pressure and temperature distribution, temperature distribution and CO₂ flow, and pressure and CO₂ flow were not prominent.

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