

亚麻籽挤压膨化脱毒的工艺优化

Optimization of detoxification technology for extruding flaxseed

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中文摘要:

采用SLG67-18.5双螺杆挤压机优化亚麻籽脱毒工艺。通过二次正交旋转组合设计试验,研究了温度、含水率、螺杆转速、喂料速度对亚麻籽中氰化氢(HCN)去除率的影响。单因素分析表明,亚麻籽中HCN去除率随温度升高、含水率增加、螺杆转速提高而升高;随喂料速度增加呈抛物线,中等喂料速度脱毒效果更好。利用频数分析法进行优化,得到亚麻籽中HCN去除率有95%的可能高于90%的参数范围,即膨化温度为147~153℃,亚麻籽含水率为13.8%~17.6%,螺杆转速为186~211 r/min,喂料速度为61.7~74.0 kg/h,从而为亚麻籽脱毒和开发利用及现有挤压膨化机的操作和调整提供了理论依据。

英文摘要:

Extruding experiments were conducted in order to optimize the extruder performance, lower toxicity of flaxseed. SLG67-18.5 twin-screw extruder was used in the experiments. In the study the effects of temperature, moisture and screw speed and feeding speed on the removal rate of HCN in flaxseed were investigated. The results were analyzed with orthogonal rotary regression method to establish the relationship between performance function and each parameter. Single factors and correlative effects on performance were also discussed based on the regression model. Experimental results show that removal rate of HCN in flaxseed increased correspondingly with the increase of temperature, the increased moisture, and the improved screw speed. The effect of feeding speed on removal rate of HCN in flaxseed follows a parabola function law and middle value has better detoxification effects. An optimum range under 95% probability of removal rate of HCN more than 90% can be summarized for temperature, moisture and screw speed and feeding speed at 147~153℃, 13.8%~17.6%, 186~211 r/min and 61.7~74.0 kg/h, respectively by frequency analytical method. The study provides useful formation for detoxification of flaxseed and the operation and adjustment of existing extruder.

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