

催化、动力学与反应器

## 不同植物油脂在近临界水中水解反应动力学的比较

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收稿日期 2006-7-6 修回日期 2006-9-12 网络版发布日期 2007-5-8 接受日期

**摘要** 系统地测定了压力10 MPa、温度170℃~240℃范围内橄榄油、花生油、大豆油、红花油等植物油脂在近临界水中无催化水解反应动力学数据。实验结果表明,近临界水中油脂水解反应是一个典型的自催化反应,采用二级自催化反应动力学模型对动力学数据进行了拟合,得到了橄榄油、花生油、大豆油、红花油等四种植物油脂的水解反应活化能分别为41.8 kJ/mol、37.3 kJ/mol、37.7 kJ/mol、31.2 kJ/mol。油脂水解活化能与其碘价密切相关,随着油脂碘价的增加,水解活化能逐渐降低。

**关键词** [近临界水](#); [橄榄油](#); [花生油](#); [大豆油](#); [红花油](#); [水解](#); [反应动力学](#)

分类号

## Comparison of hydrolysis kinetics of different vegetable oils in near-critical water

### Abstract

The kinetics of hydrolysis of olive oil, peanut oil, soybean oil, safflower oil in near-critical water was systematically determined in the temperature range from 170°C to 240°C and at pressure of 10 MPa. From the results, it could be seen that the vegetable oil hydrolysis in near-critical water was a typical self-catalyzed reaction. With a second-order kinetics equation, the activation energies evaluated were 41.8 kJ·mol<sup>-1</sup> for olive oil, 37.3 kJ·mol<sup>-1</sup> for peanut oil, 37.7 kJ·mol<sup>-1</sup> for soybean oil, 31.2 kJ·mol<sup>-1</sup> for safflower oil respectively. The activation energies of different vegetable oils had a close relationship with their iodine values. With increasing iodine value, the activation energy of vegetable oil hydrolysis in near-critical water decreased.

**Key words** [near-critical water](#); [olive oil](#); [peanut oil](#); [soybean oil](#); [safflower oil](#); [hydrolysis](#); [kinetics](#)

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