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Influence of the Reaction Conditions on the Enzyme Catalyzed Transesterification of Castor Oil: a possible step in Biodiesel Production

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# 1 **Influence of the Reaction Conditions on the Enzyme Catalyzed**

## 2 **Transesterification of Castor Oil: a possible step in Biodiesel**

### 3 **Production**

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#### 8 **Abstract:**

9 The identification of the influence of the reaction parameters is of paramount  
10 importance when defining a process design. In this work, non-edible castor oil was  
11 reacted with methanol to produce a possible component for biodiesel blends, using  
12 liquid enzymes as the catalyst. Temperature, alcohol-to-oil molar ratio, enzyme and  
13 added water contents were the reaction parameters evaluated in the transesterification  
14 reactions. The optimal conditions, giving the optimal final FAME yield and FFA  
15 content in the methyl ester-phase was identified. At 35 °C, 6.0 methanol-to-oil molar  
16 ratio, 5 wt% of enzyme and 5 wt% of water contents, 94 % of FAME yield and 6.1 % of  
17 FFA in the final composition were obtained. The investigation was completed with the  
18 analysis of the component profiles, showing that at least 8 hours are necessary to reach a  
19 satisfactory FAME yield together with a minor FFA content.

20 **Keywords:** biodiesel; castor oil; transesterification; liquid enzymes; optimal reaction  
21 conditions

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