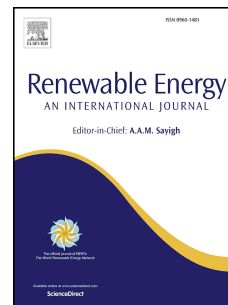


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Cucurbituril-protected $\text{Cs}_{2.5}\text{H}_{0.5}\text{PW}_{12}\text{O}_{40}$ for optimized biodiesel production from waste cooking oil

Lu Li, Changjun Zou, Lu Zhou, Lang Lin



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1 **Cucurbituril-protected Cs_{2.5}H_{0.5}PW₁₂O₄₀ for optimized biodiesel production from**
2 **waste cooking oil**

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10 **Abstract:**

11 In this research, transesterification of waste cooking oil has been studied. The
12 cucurbit[7]uril-protected Cs_{2.5}H_{0.5}PW₁₂O₄₀ (CsPW-CB[7]) is prepared as a highly
13 efficient catalyst for the direct biodiesel production via the transesterification of waste
14 cooking oil. The CsPW-CB[7] is characterized by X-ray diffraction, FT-IR. Besides,
15 response surface methodology (RSM) was used to optimize the operating parameters
16 on the conversion rate of waste cooking oil. In addition, the maximum conversion rate
17 could reach 95.1% under the optimum experimental conditions that are catalyst of 2
18 wt%, methanol/oil molar ratio of 11: 1, reaction time of 150 min and temperature of
19 70 °C. According to the assumption of pseudo-first order reaction, the activation
20 energy of the reaction was calculated as 36.0 kJ·mol⁻¹, indicating the reaction is easy
21 to react. The physicochemical properties of biodiesel product could reach the ASTM
22 D6751 standard. The results indicated that the CsPW-CB[7] catalyst showed good

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