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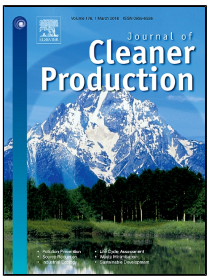

Purification of biodiesel via pre-washing of transesterified waste oil to produce less contaminated wastewater

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Abstract:

For biodiesel purification, water wash process is the simple and efficient purification process compared with the other methods, however, it produces a large amount of highly contaminated wastewater in purification. In the present research, a simple and cost-effective method was adopted to reduce fresh water consumption and to generate less contaminated wastewater in the process of purification. Two different waste frying oils (WFOs) were used as raw materials and single step alkali-catalyzed transesterification process was adopted for production of biodiesel from low free fatty acid content waste oils. After purification, both with and without 5% water pre-wash biodiesel samples were tested to investigate the influence of water pre-wash on the yield and quality of biodiesel as well as the produced wastewater. The purified biodiesel met the standards required to be a diesel alternative with respect to chemical and physical properties. By 5% water pre-wash, the amount of fresh water required for purification was reduced by 60%. Moreover, less contaminated wastewater was generated compared to the wastewater produced by hot water wash method.

Keywords: pre-washing; Biodiesel Purification; transesterification; wastewater

Abbreviations

WFO= Waste Frying Oil
FFA= Free Fatty Acid
FCO= Fried Chicken Oil
FCO1= Fried Chicken Oil biodiesel purified with hot water wash
FCO2=Fried chicken oil biodiesel purified with 5% water pre-wash
FBO= Fried Bread Oil
FBO1= Fried Bread Oil biodiesel purified with hot water wash
FBO2= Fried Bread Oil biodiesel purified with 5% water pre-wash

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