

***Optimization of Biodiesel Production with Kesambi (Schleichera Oleosa)
Seed Oil as Raw Material using a Transesterification Process Using a CaO
Catalyst from Green Mussel Shell Waste (Perna Viridis)***

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Biodiesel from kesambi seed oil is obtained through esterification followed by transesterification processes. This study aims to analyze the effect of different variations in temperature and mass of green mussel catalyst on the biodiesel production process from kesambi seed oil, and to analyze the variations in temperature and mass of CaO catalyst from green mussel shells that can produce biodiesel with the highest yield. The study uses Taguchi data processing technique with 2 factors and 3 levels. The first factor is the concentration of adsorbent catalyst with variations (4% w/v, 5% w/v, and 6% w/v). The second factor is temperature with variations (55°C, 65°C, and 75°C). Based on Taguchi analysis, the best yield value of 75.28% is obtained at 55°C temperature with 5% catalyst concentration. The testing parameters include density of 887 kg/m³, kinematic viscosity value of 2.82 cSt, acid value of 0.79 MgKOH/gr, where the acid value does not meet the biodiesel quality standard SNI 7182:2015. Cetane number with a value of 74.96%, iodine number of 7.06, and methyl ester content of 116.29%, which have met the biodiesel standard SNI 7182:2015.

Keywords: Biodiesel, Green mussel shells, Kesambi seed oil.