

Penggunaan co-solvent n-heksana untuk meningkatkan yield biodiesel pada reaksi transesterifikasi langsung dari mikroalga chlorophyta = Utilization of n hexane as co solvent to increase biodiesel yield on direct transesterification reaction from chlorophyta microalgae / Pijar Religia

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Abstrak

ABSTRAK
Reaksi transesterifikasi langsung membutuhkan optimasi kondisi reaksi disebabkan proses ekstraksi lipid dan reaksi transesterifikasi terjadi di tempat dan waktu yang sama. Pemanfaatan co-solvent dianggap sebagai salah satu cara untuk meningkatkan yield dalam reaksi transesterifikasi langsung. Pada penelitian ini dilakukan transesterifikasi langsung pada mikroalga chlorophyta yaitu Nannochloropsis sp dan Chlorella vulgaris. Desain variasi yang dilakukan mencakup rasio volum metanol : n-heksana, rasio molar lipid : metanol, dan waktu reaksi. Yield biodiesel diukur secara gravimetri. Dari variasi ini, kondisi rasio volum metanol : n-heksana 1:1, rasio molar lipid : metanol 1:400, dan waktu reaksi 4 jam mampu meningkatkan yield biodiesel mencapai 94,93% untuk C.vulgaris dan 90,9% untuk Nannochloropsis sp. Biodiesel yang diperoleh dianalisis kandungan FAMEnya dengan Kromatografi Gas dan Spektroskopi Massa (GCMS). Kandungan asam lemak jenuh lebih dominan pada biodiesel dari Nannochloropsis sp. mencapai 52,72%.

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ABSTRACT

Direct transesterification reaction requires optimization of reaction conditions due to lipid extraction and transesterification reactions that occur at the same place and time. Utilization of co-solvent is considered as one way to increase biodiesel yield in the direct transesterification reaction. In this research, the direct transesterification was done on Chlorophyta microalgae, those are Chlorella vulgaris and Nannochloropsis sp. Design variations are including the volume ratio of methanol: n-hexane, the molar ratio of lipid: methanol, and reaction time. Biodiesel yield was measured gravimetrically. From these variations, the volume ratio of methanol n-hexane 1:1, molar ratio of lipid:methanol 1:400, and reaction time 4 hours can increase biodiesel yield until 94.93% for C.vulgaris and 90.9% for Nannochloropsis sp. FAME contents in biodiesel were analyzed by Gas Chromatography and Mass Spectroscopy (GCMS). Saturated fatty acid content is more dominant on biodiesel from Nannochloropsis sp. reached 52.72%.