

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

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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%.