



SINTESIS SENYAWA OMEGA-6 TERKONJUGASI  
ASAM 8,10,12-OKTADOKATRIENOAT  
DARI MINYAK JARAK;  
SYNTHESIS OF CONJUGATED OMEGA-6 8,10,12-  
OCTADOKATRIENOIC ACID FROM CASTOR OIL

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## SINTESIS SENYAWA OMEGA-6 TERKONJUGASI ASAM 8,10,12- OKTADOKATRIENOAT DARI MINYAK JARAK

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### INTISARI

Telah dilakukan sintesis senyawa omega-6 terkonjugasi asam 8,10,12-oktadokatrienoat dari minyak jarak. Senyawa asam 8,10,12-oktadokatrienoat diperoleh melalui beberapa tahap reaksi yaitu: (1) isolasi metil risinoleat dari minyak jarak melalui reaksi transesterifikasi menggunakan KOH, (2) Reaksi hidrolisis metil risinoleat menggunakan KOH, (3) reaksi oksidasi ikatan rangkap dari asam risinoleat menggunakan pereaksi  $\text{KMnO}_4$  encer pada suasana asam pada suhu  $0-5^\circ\text{C}$ , dan (4) reaksi dehidrasi gugus hidroksil menggunakan pereaksi  $\text{P}_2\text{O}_5$  pada suhu  $140^\circ\text{C}$  selama 3,5 jam. Konfirmasi struktur dari senyawa yang dihasilkan dilakukan dengan spektrometer IR,  $^1\text{H-NMR}$ , UV-Vis dan GC-MS.

Reaksi transesterifikasi minyak jarak menggunakan KOH menghasilkan komponen utama metil risinoleat dengan rendemen 77%. Reaksi hidrolisis terhadap metil risinoleat menghasilkan asam risinoleat dengan rendemen 74%. Reaksi oksidasi asam risinoleat menghasilkan senyawa asam 9,10,12-trihidroksi stearat (THSA) dengan rendemen total 75% berupa dua diastereoisomer dari bentuk  $\alpha$  dan  $\beta$ . Produk  $\alpha$  berbentuk kristal putih dengan titik leleh  $106^\circ\text{C}$  sedangkan produk  $\beta$  berbentuk padatan putih dengan titik leleh  $125^\circ\text{C}$ . Reaksi dehidrasi terhadap asam 9,10,12-trihidroksi stearat menghasilkan senyawa omega-6 terkonjugasi asam 8,10,12-oktadokatrienoat berupa cairan kecoklatan dengan rendemen 81%. Gugus karboksilat pada asam 9,10,12-trihidroksi stearat tidak terpengaruh oleh adanya reaksi dehidrasi.

Kata kunci : *omega-6 terkonjugasi, asam 8,10,12-oktadokatrienoat, reaksi dehidrasi*



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## **SYNTHESIS OF CONJUGATED OMEGA-6 8,10,12- OCTADECATRIENOIC ACID FROM CASTOR OIL**

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### **ABSTRACT**

Synthesis of conjugated omega-6 compounds 8,10,12-octadecatrienoic acid from castor oil has been done. 8,10,12-octadecatrienoic acid was synthesized through several steps of reaction, i.e. (1) isolation of methyl ricinoleate from castor oil by transesterification in the presence of potassium hydroxide, (2) hydrolysis of methyl ricinoleate with potassium hydroxide, (3) oxidation to double bond of ricinoleic acid using dilute potassium permanganate in alkaline condition at 0-5°C, and (4) dehydration of hydroxyl group of trihydroxy stearic acid using P<sub>2</sub>O<sub>5</sub> at 140°C for 3.5 hours. Structural characterization was done by means of IR, <sup>1</sup>H-NMR, UV-Vis dan GC-MS spectrometers.

Transesterification of castor oil using KOH produced methyl ricinoleate as main component in 77% yield. Hydrolysis of methyl ricinoleate produced ricinoleic acid in total yield of 74%. Oxydation of ricinoleic acid produced 9,10,12-trihydroxy stearic acid (THSA) in total yield of 75% which were found as two diastereoisomers i.e., α dan β. α product was produced as white crystal with melting point of 106°C, while β product was obtained as white powder with melting point of 125°C. Dehydration reaction to 9,10,12-trihydroxy stearic acid produced conjugated omega-6 compounds 8,10,12-octadecatrienoic acid which was produced as brownish liquid, in 81% yield. Carboxylic group of 9,10,12-trihydroxy stearic acid was not affected by dehydration reaction.

**Keywords:** *conjugated omega-6, 8,10,12-octadecatrienoic acid, dehydration reaction*