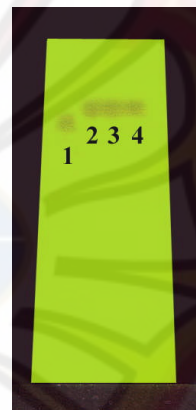Gambar lampiran 1 foto alat sintesis

Foto hasil Kromatografi Lapis Tipis

Eluen I *n*-heksana - kloroform (2 : 3)

Eluen II *n*-heksana - Etil asetat (3 : 1)

Eluen II Toluena - Etil asetat (7 : 3)

Ket : 1. Eugenol
     2. Senyawa hasil sintesis I
     3. Senyawa hasil sintesis II
     4. Senyawa hasil sintesis III.

Penampak bercak : Sinar UV 254 nm

Contoh Perhitungan Rendemen Senyawa Hasil Sintesis dengan jumlah penambah TBAB sebesar 20 mol%

Berat molekul eugenol = 164,21

Berat molekul metil eugenol = berat molekul metil isoeugenol = 178,23

Replikasi I : berat eugenol = 0,8214 gram

$$\text{mmol eugenol} = \frac{0,8214}{164,21} x 1000 = 5,00 \text{ mmol}$$

berat hasil   = 0,7362 gram

$$\text{mmol hasil} = \frac{0,7362}{178,23} x 1000 = 4,13 \text{ mmol}$$

$$\text{Rendemen hasil sintesis (\%)} = \frac{4,13 \text{ mmol}}{5,05 \text{ mmol}} x 100\%$$

$$= 82,6\%$$

Replikasi II : berat eugenol = 0,82 gram

$$\text{mmol eugenol} = \frac{0,82}{164,21} x 1000 = 5,00 \text{ mmol}$$

berat hasil   = 0,7314 gram

$$\text{mmol hasil} = \frac{0,7314}{178,23} x 1000 = 4,10 \text{ mmol}$$

$$\text{Rendemen hasil sintesis (\%)} = \frac{4,10 \text{ mmol}}{5,00 \text{ mmol}} x 100\%$$

$$= 82\%$$

Replikasi III : berat eugenol = 0,82 gram

$$\text{mmol eugenol} = \frac{0,82}{164,21} x 1000 = 5,00 \text{ mmol}$$
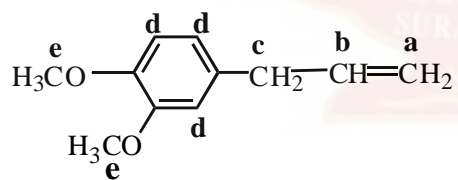
berat hasil   = 0,7452 gram

$$\text{mmol hasil} = \frac{0,7452}{178,23} x 1000 = 4,18 \text{ mmol}$$

$$\text{Rendemen hasil sintesis (\%)} = \frac{4{,}18 \text{ mmol}}{5{,}00 \text{ mmol}} \times 100\%$$

$$= 83{,}6\%$$

$$\text{Rendemen rata-rata} = \frac{82{,}6\% + 82\% + 83{,}6\%}{3}$$

$$= 82{,}7\%$$

Lampiran 4

Contoh Perhitungan Perbandingan rendemen metil eugenol dan metil isoeugenol berdasarkan perbandingan tinggi integrasi pada spektrum ^{1}H-NMR.

Metil eugenol
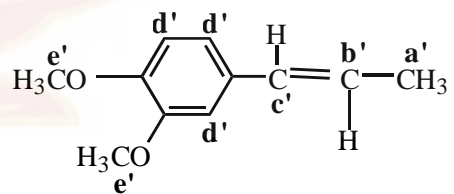
Metil isoeugenol

Perbandingan tinggi integrasi senyawa hasil sintesis dengan penambahan katalis

TBAB 20 mol%

Tinggi integrasi proton C (2H) = 3,6 cm (δ = 3,33 ppm)

$$IH = 1,8 \text{ cm}$$

Tinggi integrasi proton a^1 (3H) = 3,5 cm (δ = 1,85 ppm)

$$1H = 1,16 \text{ cm}$$

1H proton metil eugenol (c) : 1H proton metil isoeugenol (a^1)

1,8	:	1,16
1,5	:	1

Rendemen total senyawa hasil sintesis = 82,7%

Perbandingan metil eugenol: metil isoeugenol = 1,5 : 1

Rendemen metil eugenol = $\dfrac{1,5}{2,5} x 82,7\% = 49,62\%$

Rendemen metil isoeugenol = $\dfrac{1}{2,5} x 70,2\% = 33,08\%$.