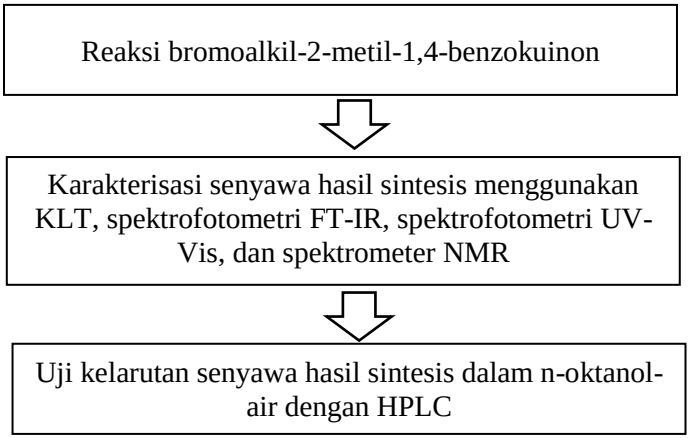
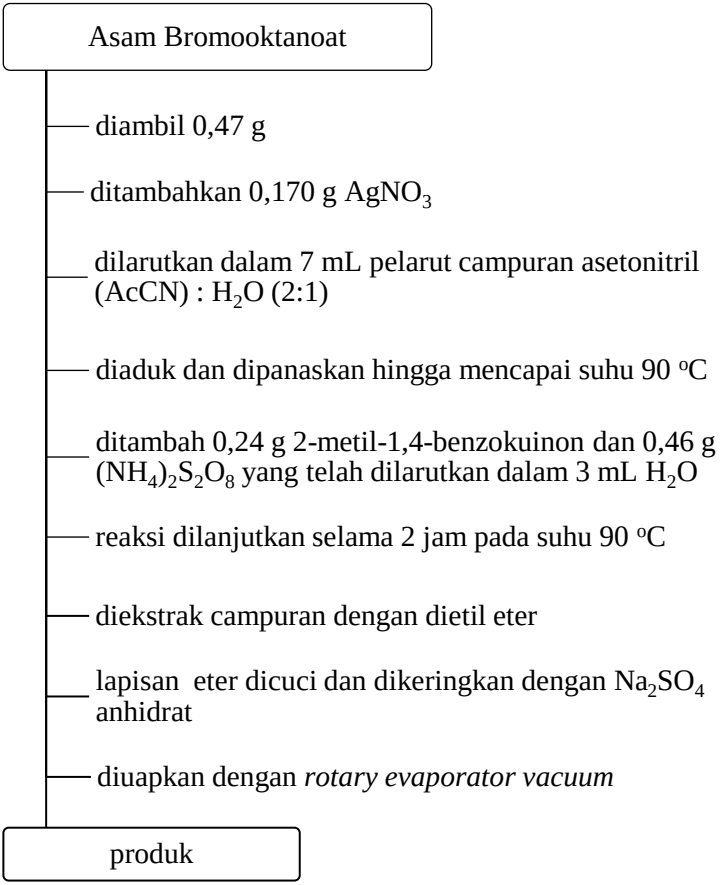
LAMPIRAN

Lampiran A: Diagram alir penelitian

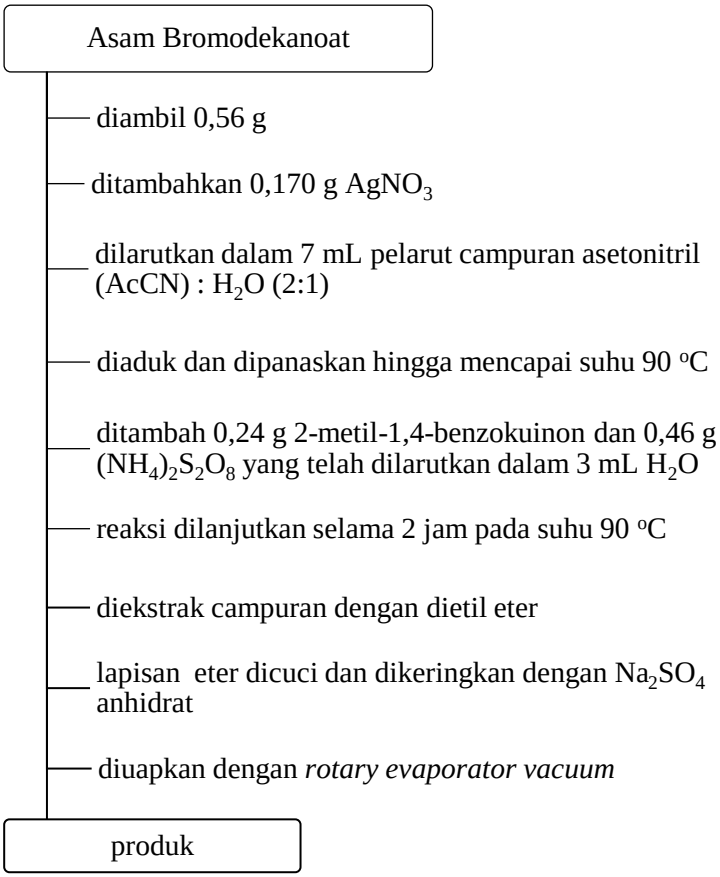
A.1: Skema kerja penelitian



A.2: Skema kerja reaksi 5-(7-bromoheptil)-2-metil-1,4-benzokuinon

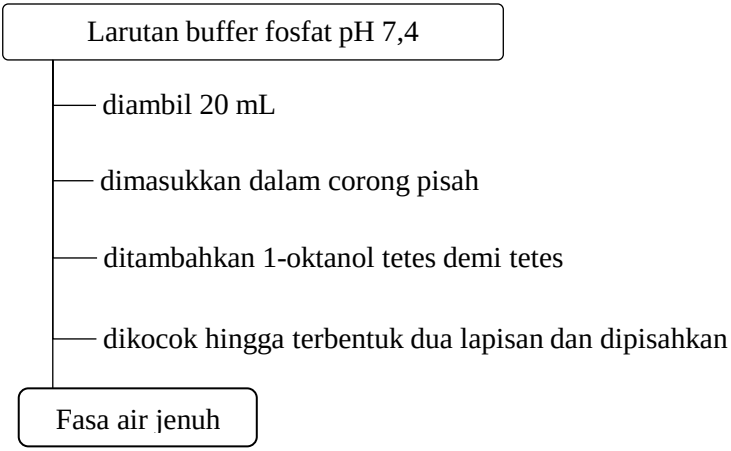


A.3: Skema kerja reaksi 5-(10-bromodesil)-2-metil-1,4-benzokuinon

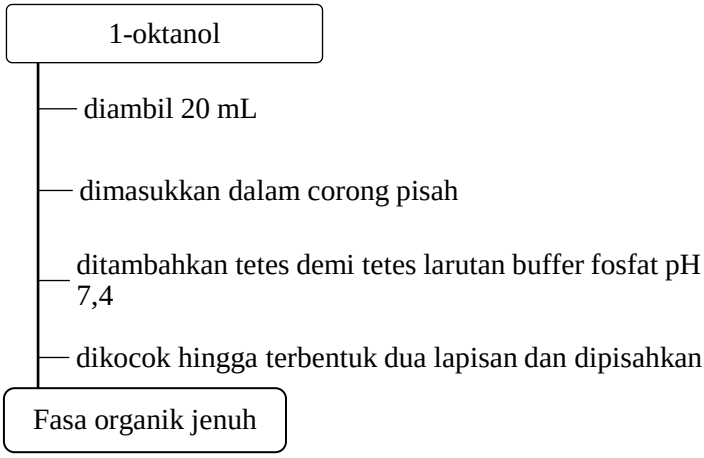


A.4: Uji kelarutan dalan n-oktanol-air

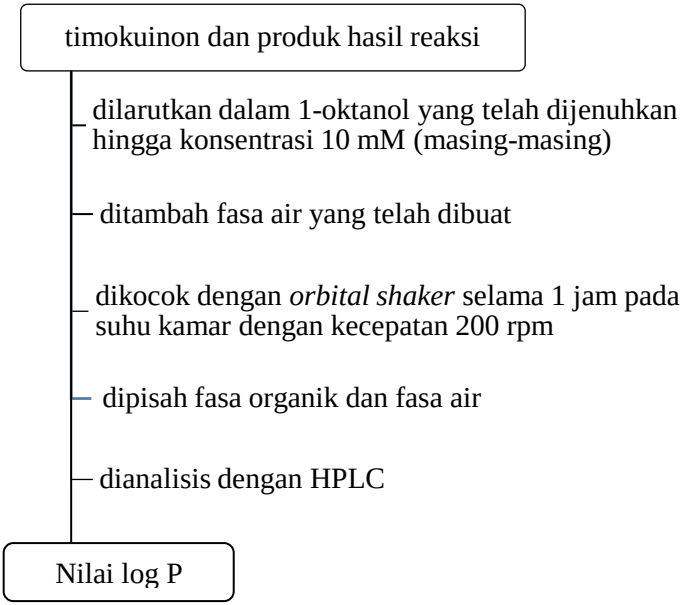
-Penjenuhan buffer fosfat dengan n-oktanol



-Penjenuhan n-oktanol



--Preparasi sampel



Lampiran B: Perhitungan

B.1 Reaksi Bromoalkil-2-metil-1,4- benzokuinon

B.1.1 Perhitungan massa 2 metil-1,4-benzokuinon

BM 2-metil-1,4-benzokuinon = 122,12 gr/mol

- 2-metil-1,4-benzokuinon 2 mmol

Mol 2-metil-1,4-benzokuinon =2 mmol x $\frac{1\ mol}{1000\ mmol}$ = 0,02 mol

Mol 2-metil-1,4-benzokuinon = $\frac{massa\ 2-\text{metil}-1,4-\text{benzokuinon}}{BM\ 2-\text{metil}-1,4-\text{benzokuinon}}$

Massa 2-metil-1,4-benzokuinon = 0,02 mol × 122,12 gr/mol
= 0.244 gr

B.1.2 Perhitungan massa $HOOC(CH_2)_7Br$

BM $HOOC(CH_2)_7Br$ = 223,11 gr/mol

Mol $HOOC(CH_2)_7Br$ = $\frac{2,1\ mmol}{1000\ m}$ = 0,0021 mol

Mol $HOOC(CH_2)_7Br$ = $\frac{massa\ \text{HOOC(CH2)7Br}}{BM\ \text{HOOC(CH2)7Br}}$

Massa $HOOC(CH_2)_7Br$ = 0,0021mol×223,11 gr/mol
= 0,47 gr

B.1.3 Perhitungan massa $HOOC(CH_2)_{10}Br$

BM $HOOC(CH_2)_7Br$ = 265,18 gr/mol

Mol $HOOC(CH_2)_7Br$ = $\frac{2,1\ mmol}{1000\ m}$ = 0,0021 mol

Mol $HOOC(CH_2)_7Br$ = $\frac{massa\ \text{HOOC(CH2)10Br}}{BM\ \text{HOOC(CH2)10Br}}$

Massa $HOOC(CH_2)_7Br$ = 0,0021mol×265,18 gr/mol
= 0,56 gr

B.1.4 Perhitungan massa $AgNO_3$

BM $AgNO_3$= 169,87 gr/mol

Mol $AgNO_3$ = 1 $mmol\ x\ \frac{1\ mol}{1000\ mmol}$ = 0,001 mol

Mol $AgNO_3$ = $\frac{massa\ \text{AgNO3}}{BM\ \text{AgNO3}}$

Massa $AgNO_3$ = 0,001 mol × 169,87 gr/mol
= 0,17 gr

B.1.5 Perhitungan massa $(NH_4)_2S_2O_8$

BM $(NH_4)_2S_2O_8$= 228,20 gr/mol

Mol $(NH_4)_2S_2O_8$ $= 2\ mmol\ x \frac{2\ mol}{1000\ mmol} = 0{,}002$ mol

Mol $(NH_4)_2S_2O_8$ $= \frac{massa\ (NH_4)_2S_2O_8}{BM\ (NH_4)_2S_2O_8}$

Massa $(NH_4)_2S_2O_8$ = 0,002 mol × 228,20 gr/mol
= 0,46 gr

B.2 Uji Kelarutan dalam n-oktanol-air

B.2.1 Pembuatan buffer fosfat

a. Perhitungan massa $NaH_2PO_4 .H_2O$ 0.1 M

BM $NaH_2PO_4 .H_2O$ = 137,9 g/mol

Mol $NaH_2PO_4 .H_2O$ = M x V
= 0.1 mol/L x 0.1 L
= 0.01 mol

Massa $NaH_2PO_4.H_2O$ = mol x BM
= 0.01 mol x 137,9 g/mol
= 1.38 g

b. Perhitungan massa Na_2HPO_4 0.1 M

BM Na_2HPO_4 = 268 g/mol

Mol Na_2HPO_4 = M x V
= 0,1 mol/L x 0.1 L
= 0.01 mol

Massa Na_2HPO_4= mol x BM
= 0.01 mol x 268 g/mol
= 2.68 g

B.2.2 Perhitungan massa untuk koefisien partisi

a. Timokuinon

BM $C_{10}H_{12}O_2Br$ = 164,20 g/mol

M $= \frac{\text{massa}}{\text{BM}}$ x $\frac{1000}{\text{mL}}$

10 mM $= \frac{\text{massa}}{164{,}2\ \text{g/mol}}$ x $\frac{1000}{3\ \text{mL}}$

0,01 M $= \frac{\text{massa}}{164{,}2\ \text{g/mol}}$ x $\frac{1000}{3\ \text{mL}}$

Massa = 4,93 mg

b. Massa (5-(7-bromoheptil)-2-metil-1,4-benzokuinon)

BM $C_{14}H_{17}O_2Br$ = 299,208 g/mol

$$M = \frac{\text{massa}}{\text{Mr}\left(\frac{g}{mol}\right)} \text{ x } \frac{1000}{\text{volume (mL)}}$$

$$10 \text{ mM} = \frac{massa}{299{,}208\ g/mol}\ x\ \frac{1000}{3\ mL}$$

$$0{,}01 \text{ M} = \frac{massa}{299{,}208\ g/mol}\ x\ \frac{1000}{3\ mL}$$

Massa = 8,9 mg

c. Massa (5-(10-bromodesil)-2-metil-1,4-benzokuinon)

BM $C_{17}H_{23}O_2Br$= 341,289 g/mol

$$M = \frac{\text{massa}}{\text{Mr}\left(\frac{g}{mol}\right)} \text{ x } \frac{1000}{\text{volume (mL)}}$$

$$10 \text{ mM} = \frac{\text{massa}}{341{,}289\ \text{g/mol}} \text{ x } \frac{1000}{3\ \text{mL}}$$

$$0{,}01 \text{ M} = \frac{\text{massa}}{341{,}289\ \text{g/mol}} \text{ x } \frac{1000}{3\ \text{mL}}$$

Massa = 10,2 mg

B.3 Rendemen produk bromoalkil-2-metil-1,4-benzokuinon

B.3.1 Rendemen produk (5-(7-bromoheptill)-2-metil-1,4-benzokuinon)

Massa produk = 0,07g

$$Yield = \frac{\text{mol produk}}{\text{mol reaktan}} \text{ x } 100\%$$

$$= \frac{\frac{\text{massa}}{\text{Mr}}}{4{,}1\ \text{mmol}} \text{ x } 100\%$$

$$= \frac{\frac{0{,}07\ \text{g}}{299{,}208\ \text{g/mol}}}{4{,}1\ \text{mmol}} \text{ x } 100\%$$

$$= 5{,}71\%$$

B.3.2 Rendemen produk (5-(10-bromodesil)-2-metil-1,4-benzokuinon)

Massa produk = 0,06 g

$$Yield = \frac{\text{mol produk}}{\text{mol reaktan}} \text{ x } 100\%$$

$$= \frac{\frac{\text{massa}}{\text{Mr}}}{4{,}1 \text{ mmol}} \text{ x } 100\%$$

$$= \frac{\frac{0{,}06 \text{ g}}{341{,}289 \text{ g/mol}}}{4{,}1 \text{ mmol}} \text{ x } 100\%$$

$$= 4{,}29\%$$

B.4. Perhitungan kelarutan

B.4.1 Perhitungan kelarutan timokuinon dalam n-oktanol-air (3:7)

λmaks = 254 nm

$$\text{Log P} = \log \frac{\text{Ao/Vo}}{\text{Aa/Va}}$$

$$= \log \frac{63970392/3}{920323/7}$$

$$= 2{,}21$$

B.4.2 Perhitungan kelarutan produk (5-(7-bromoheptil)-2-metil-1,4-benzokuinon) dalam n-oktanol-air (3:7)

λmaks = 254 nm

$$\text{Log P} = \log \frac{\text{Ao/Vo}}{\text{Aa/Va}}$$

$$= \log \frac{1147524770/3}{4912910/7}$$

$$= 1{,}74$$

B.4.3 Perhitungan kelarutan produk (5-(10-bromodesil)-2-metil-1,4-benzokuinon) dalam n-oktanol-air (3:7)

λmaks = 254 nm

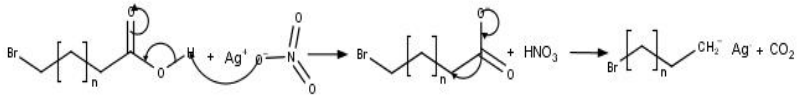
$$\text{Log P} = \log \frac{\text{Ao/Vo}}{\text{Aa/Va}}$$

$$= \log \frac{143181139/3}{5413222/7}$$

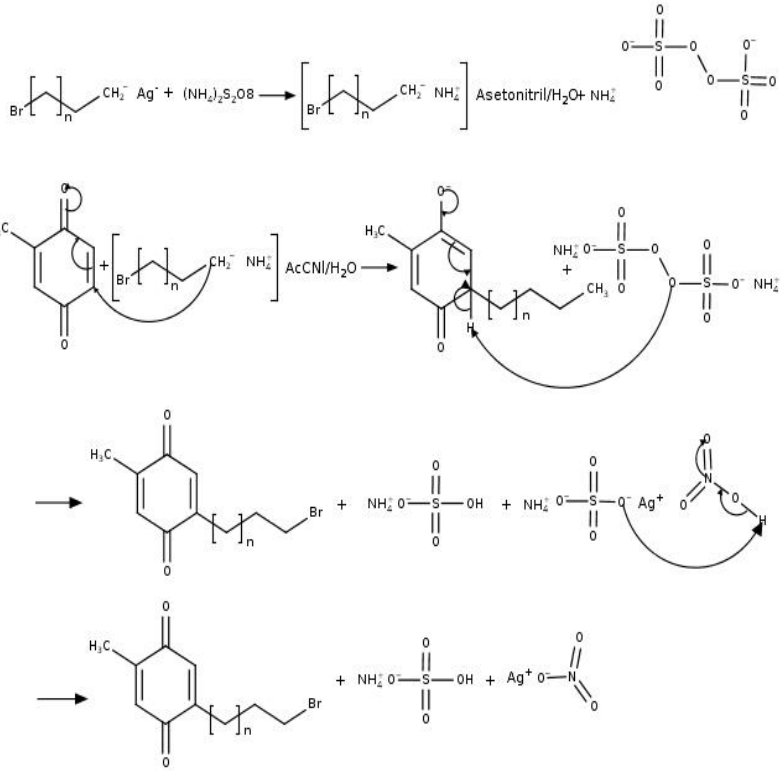
$$= 1{,}79$$

Lampiran C: Mekanisme Reaksi

C.1 Reaksi dekarboksilasi



C.2 Reaksi alkilasi



Lampiran D: Dokumentasi

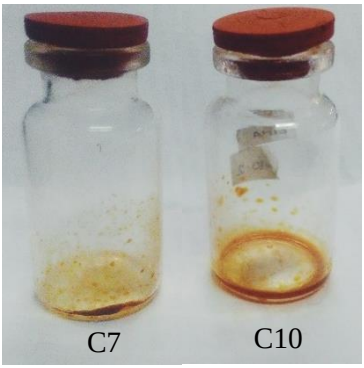
D.1 Rangkaian alat refluks

D.2 Ekstraksi dengan dietil eter

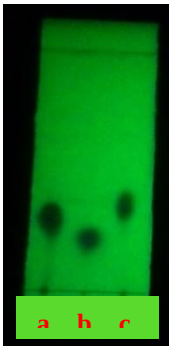
D.3 *Crude product* C7 dan C10

D.4 Pemurnian dengan komatografi kolom

D.5 Produk alkilasi C7 dan C10

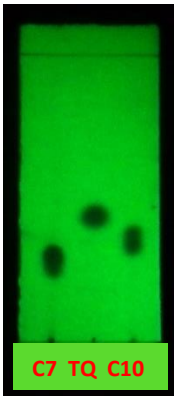


D.6 Hasil KLT Produk alkilasi C7, SM, dan C10



Keterangan:
a= alkilasi C7
b= *starting material*
c= alkilasi C10

D.7 Hasil KLT Produk alkilasi C7, TQ, dan C10



Keterangan:
C7= alkilasi C7
TQ= Timokuinon
C10= alkilasi C10