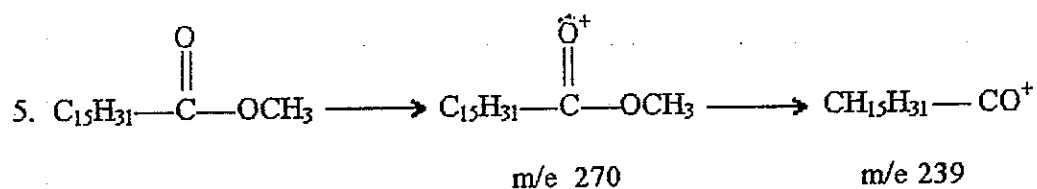
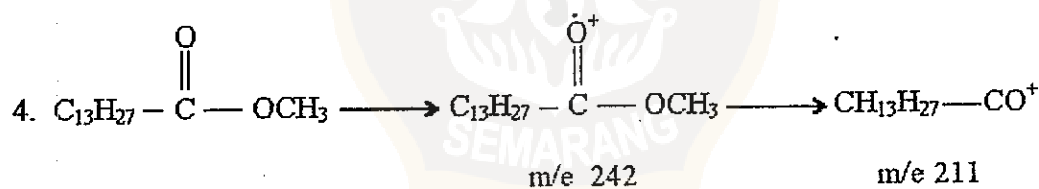
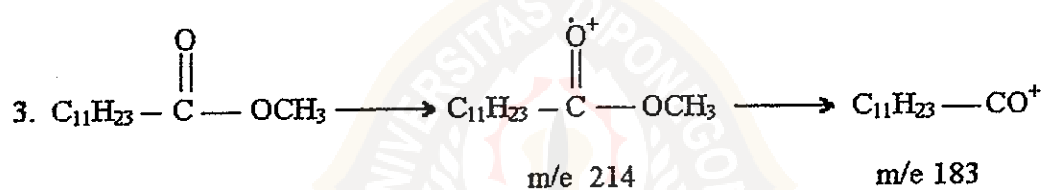
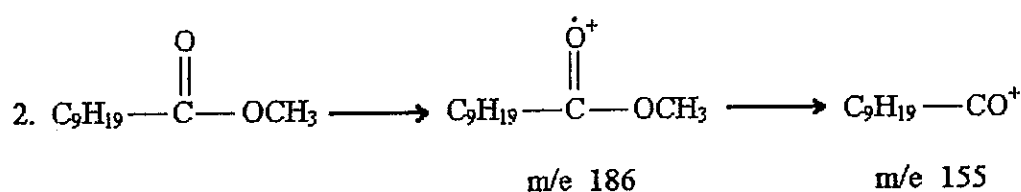
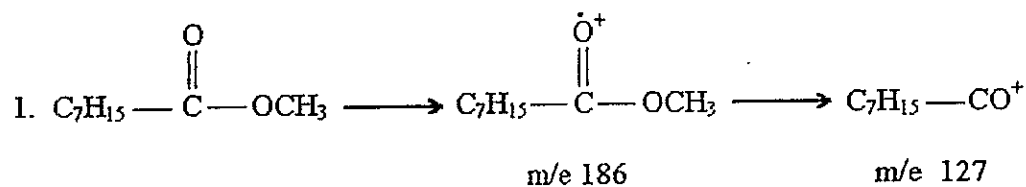
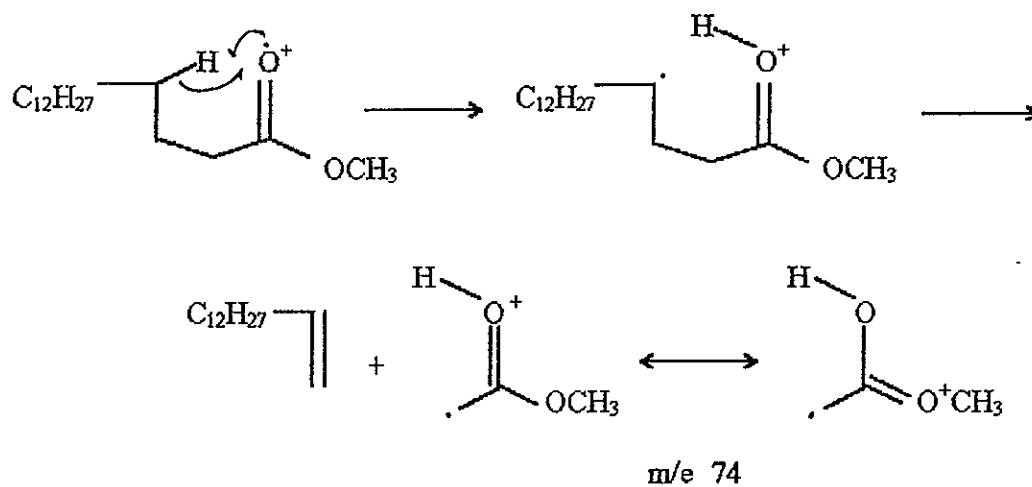


Lampiran 1. Pola Fragmentasi spektra MS

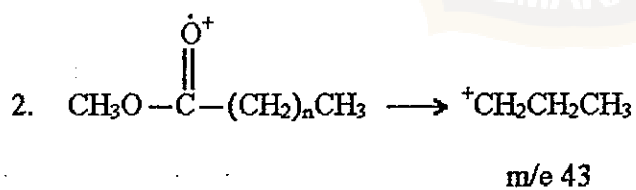
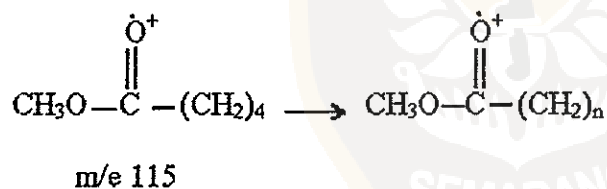
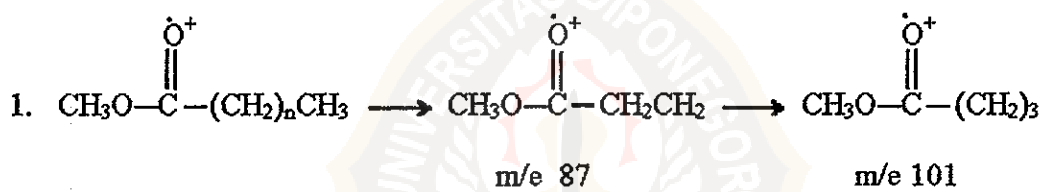
A. Pembentukan ion molekul



B. Penyusunan ulang McLafferty yang merupakan puncak dasar ester metil rantai lurus



C. Pemecahan pada tiap ikatan C-C serta ion berkontungan oksigen



Lampiran 2. Penghitungan Bilangan HLB

1. Bilangan HLB gugus hidrofilik

$$\text{HLB} = \Sigma (\text{bilangan HLB gugus hidrofilik})$$

a. Fosfatidiletanolamin

$$\begin{aligned} \text{HLB} &= (2 \times \text{gugus ester}) + (3 \times \text{-O-}) + (1 \times \text{N}) + (1 \times \text{-OH}) \\ &= (2 \times 2,4) + (3 \times 1,3) + (1 \times 9,4) + (1 \times 1,9) \\ &= 20 \end{aligned}$$

b. Fosfatidilserine

$$\begin{aligned} \text{HLB} &= (2 \times \text{gugus ester}) + (3 \times \text{-O-}) + (1 \times \text{N}) + (1 \times \text{-OH}) + (1 \times \text{-COOH}) \\ &= (2 \times 2,4) + (3 \times 1,3) + (1 \times 9,4) + (1 \times 1,9) + (1 \times 2,1) \\ &= 22,1 \end{aligned}$$

2. Bilangan HLB gugus hidrofobik fosfatidiletanolamin dan fosfatidilserine

$$\text{HLB} = \Sigma (\text{Bilangan HLB gugus hidrofobik})$$

a. C₇H₁₅COOH dan C₉H₁₉COOH

$$\begin{aligned} \text{HLB} &= (-\text{CH}_2-\text{CH}-\text{CH}_2) + (-\text{CH}_2-\text{CH}_2 / -\text{CH}_2-\text{CH}-) + (\text{C}_7\text{H}_{15}-) + (\text{C}_9\text{H}_{19}-) \\ &= (3 \times 0,475) + (2 \times 0,475) + (7 \times 0,475) + (9 \times 0,475) \\ &= 1,43 + 0,95 + 3,33 + 4,28 \\ &= 9,99 \end{aligned}$$

b. C₇H₁₅COOH dan C₁₁H₂₃COOH

$$\begin{aligned} \text{HLB} &= (-\text{CH}_2-\text{CH}-\text{CH}_2) + (-\text{CH}_2-\text{CH}_2 / -\text{CH}_2-\text{CH}-) + (\text{C}_7\text{H}_{15}-) + (\text{C}_{11}\text{H}_{23}-) \\ &= (3 \times 0,475) + (2 \times 0,475) + (7 \times 0,475) + (11 \times 0,475) \end{aligned}$$

$$= 1,43 + 0,95 + 3,33 + 5,23$$

$$= 10,94$$

c. $C_7H_{15}COOH$ dan $C_{13}H_{27}COOH$

$$HLB = (-CH_2-CH-CH_2) + (-CH_2-CH_2 / -CH_2-CH-) + (C_7H_{15}-) + (C_{13}H_{27}-)$$

$$= (3 \times 0,475) + (2 \times 0,475) + (7 \times 0,475) + (13 \times 0,475)$$

$$= 1,43 + 0,95 + 3,33 + 6,18$$

$$= 11,89$$

d. $C_7H_{15}COOH$ dan $C_{15}H_{31}COOH$

$$HLB = (-CH_2-CH-CH_2) + (-CH_2-CH_2 / -CH_2-CH-) + (C_7H_{15}-) + (C_{15}H_{31}-)$$

$$= (3 \times 0,475) + (2 \times 0,475) + (7 \times 0,475) + (15 \times 0,475)$$

$$= 1,43 + 0,95 + 3,33 + 7,13$$

$$= 12,84$$

e. $C_9H_{19}COOH$ dan $C_{11}H_{23}COOH$

$$HLB = (-CH_2-CH-CH_2) + (-CH_2-CH_2 / -CH_2-CH-) + (C_9H_{19}-) + (C_{11}H_{23}-)$$

$$= (3 \times 0,475) + (2 \times 0,475) + (9 \times 0,475) + (11 \times 0,475)$$

$$= 1,43 + 0,95 + 4,28 + 5,23$$

$$= 11,89$$

f. $C_9H_{19}COOH$ dan $C_{13}H_{27}COOH$

$$HLB = (-CH_2-CH-CH_2) + (-CH_2-CH_2 / -CH_2-CH-) + (C_9H_{19}-) + (C_{13}H_{27}-)$$

$$= (3 \times 0,475) + (2 \times 0,475) + (9 \times 0,475) + (13 \times 0,475)$$

$$= 1,43 + 0,95 + 4,28 + 6,18$$

$$= 12,84$$

g. $C_9H_{19}COOH$ dan $C_{15}H_{31}COOH$

$$\begin{aligned} HLB &= (-CH_2-CH-CH_2) + (-CH_2-CH_2 / -CH_2-CH-) + (C_9H_{19}-) + (C_{15}H_{31} -) \\ &= (3 \times 0,475) + (2 \times 0,475) + (9 \times 0,475) + (15 \times 0,475) \\ &= 1,43 + 0,95 + 4,28 + 7,13 \\ &= 13,79 \end{aligned}$$

h. $C_{11}H_{23}COOH$ dan $C_{13}H_{27}COOH$

$$\begin{aligned} HLB &= (-CH_2-CH-CH_2) + (-CH_2-CH_2 / -CH_2-CH-) + (C_{11}H_{23}-) + (C_{13}H_{27} -) \\ &= (3 \times 0,475) + (2 \times 0,475) + (11 \times 0,475) + (13 \times 0,475) \\ &= 1,43 + 0,95 + 5,23 + 6,18 \\ &= 13,79 \end{aligned}$$

i. $C_{11}H_{23}COOH$ dan $C_{15}H_{31}COOH$

$$\begin{aligned} HLB &= (-CH_2-CH-CH_2) + (-CH_2-CH_2 / -CH_2-CH-) + (C_{11}H_{23}-) + (C_{15}H_{31} -) \\ &= (3 \times 0,475) + (2 \times 0,475) + (11 \times 0,475) + (15 \times 0,475) \\ &= 1,43 + 0,95 + 5,23 + 7,13 \\ &= 14,74 \end{aligned}$$

j. $C_{13}H_{27}COOH$ dan $C_{15}H_{31}COOH$

$$\begin{aligned} HLB &= (-CH_2-CH-CH_2) + (-CH_2-CH_2 / -CH_2-CH-) + (C_{13}H_{27}-) + (C_{15}H_{31} -) \\ &= (3 \times 0,475) + (2 \times 0,475) + (13 \times 0,475) + (15 \times 0,475) \\ &= 1,43 + 0,95 + 6,18 + 7,13 \\ &= 15,69 \end{aligned}$$