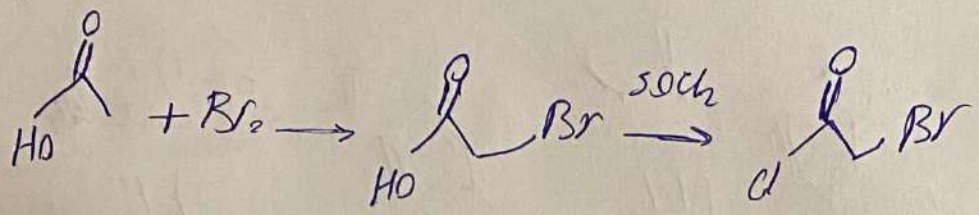
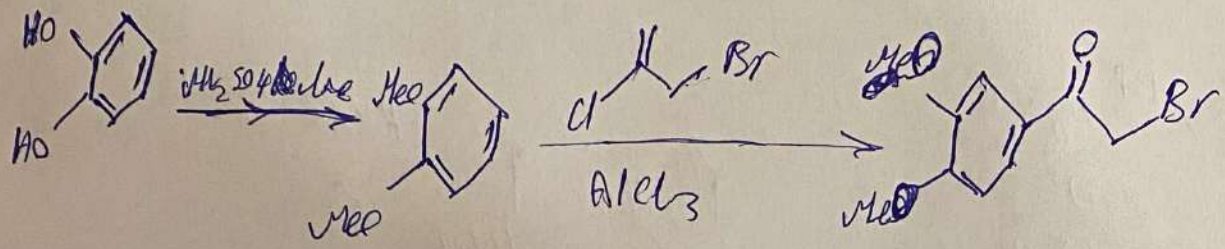
Al Tayeb seyed sajad

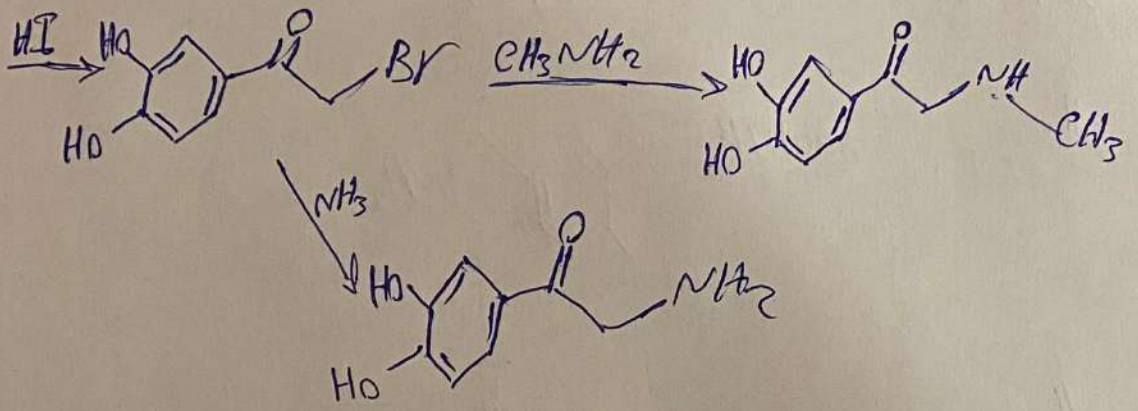
44class shahed shaikh ansari

④

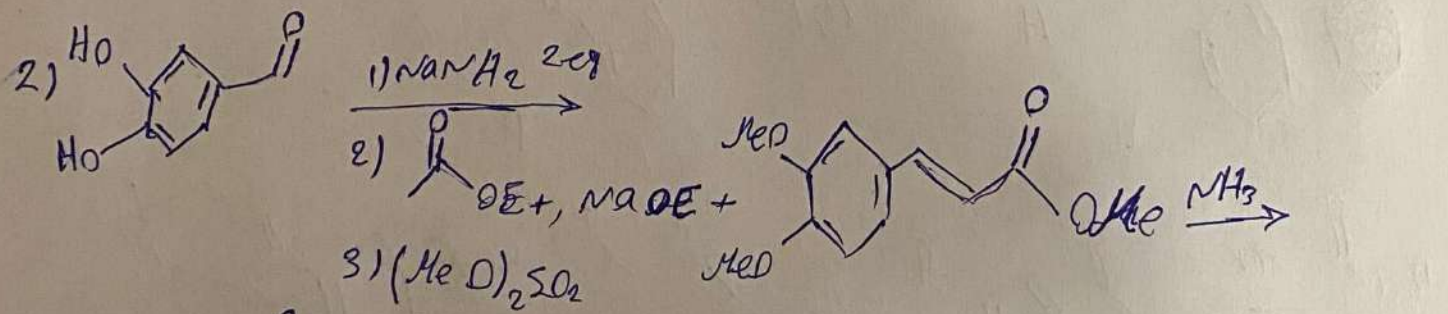
1)

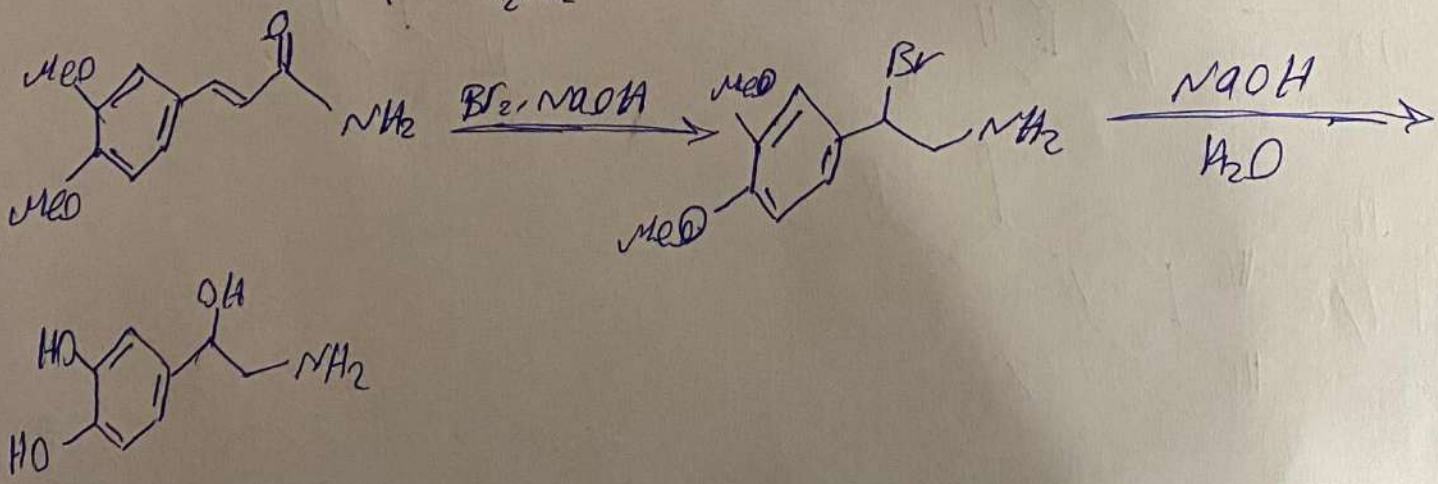






2)





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③ 1) ${}_1^1H + {}_1^1H \rightarrow {}_1^2D + e^+ + \nu_e$

${}_1^2D + {}_1^1P \rightarrow {}_2^3He + \gamma$

${}_2^3He + {}_2^3He \rightarrow {}_2^4He + 2\,{}_1^1P$

2) $A = A_0 e^{-kt}$ $\quad k = \frac{\ln 2}{T_{\frac{1}{2}}}$

$\frac{A}{A_0} = e^{-kt}$ $\quad k = 1{,}216 \cdot 10^{-4}\ \frac{1}{\text{Year}}$

$0{,}175 = e^{-kt}$ $\quad$ Object A = 14333 Year

$0{,}25 = e^{-kt}$ $\quad$ Object B = 11400 Year

$Y = {}^{14}C$

3) ${}^{40}K \xrightarrow[k_1]{1{,}300 \cdot 10^9\,Y} C = {}^{40}Ar$

${}^{40}K \xrightarrow[k_2]{1{,}444 \times 10^9\,Y} D = {}^{40}Ca$

$C = {}^{40}K\, e^{-k_1 t}$ $\quad k_1 = 5{,}33 \cdot 10^{-10}$

$D = {}^{40}K\, e^{-k_2 t}$ $\quad k_2 = 4{,}8 \cdot 10^{-9}$

$\frac{C}{D} = \frac{k_1}{k_2} = \frac{1}{9}$ $\quad C = 3$, $D = 27$, $k = 8$

${}^{40}K : C : D = 8 : 3 : 27$

$\frac{{}^{40}K}{{}^{40}K_0} = e^{-(k_1+k_2)t}$

$\ln \frac{8}{38} = -(k_1+k_2)t$

$t = 29217038$ Years

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(2)

1- 120°C - adsorbed water

1100°C - silanol groups

$$\nu_{H_2O} = \frac{0{,}3975\ mg}{18\ mg/mmol} = 0{,}02208\ mmol$$

$$C_{H_2O} = \frac{0{,}02208}{14{,}2000 \cdot 10^{-3}} = 1{,}555\ \frac{mmol}{g}$$

$$\nu_{silanol} = \frac{0{,}1681\ mg}{18\ mg/mmol} \cdot 2 = 0{,}01846\ mmol$$

$$S = 312{,}1\ \frac{m^2}{g} \cdot (14{,}2000 \cdot 10^{-3}\ g) = 4{,}439\ m^2$$

$$C_{silanol} = 18.46\ \mu mol / 4{,}439\ m^2 = 4{,}159\ \mu mol/m^2$$

2- The reverse tibration method is used to determine the concentration of weak bases.

$$SiO_2 - NH_2 + HCl \rightarrow SiO_2 - NH_3^{\oplus} + Cl^{\ominus}$$

$$SiO_2 - NH_3^{\oplus} Cl^{\ominus} + NaOH \rightarrow SiO_2 - NH_2 + NaCl + H_2O$$

$$C_{NH_2} = \frac{C_{NaOH} V_{NaOH}}{m_{sample}} = \frac{0{,}01 \cdot 0{,}08}{0{,}1245\ g} = 1{,}526\ mmol/g$$

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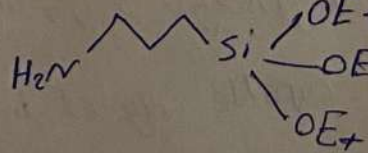
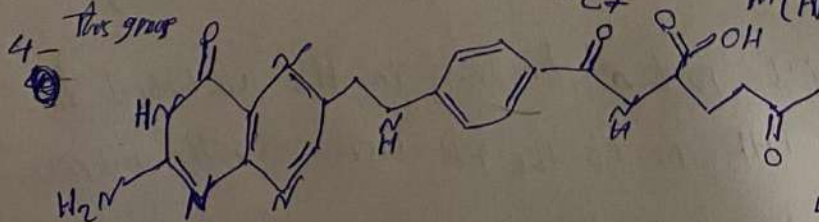
3- APTES =



5{,}0g SiO_2

$m(APTES) = 221\ \frac{mg}{mmol} \cdot 7{,}85 = 1{,}869\ g$

4- This group



hydrolysis reaction

$M_{FA} = 441\ mg/mmol$

$m_{FA} = 7{,}63 \cdot 0{,}003 \cdot 441 = 10{,}094\ mg$

5-

$$\frac{mass}{ms} = \frac{0{,}1500\ g}{1\ g}$$

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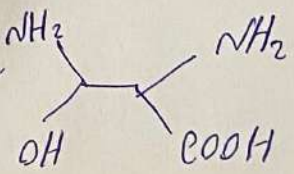
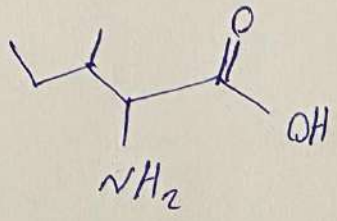
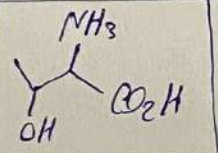
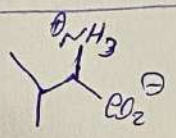
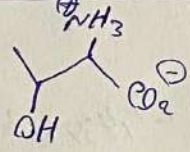
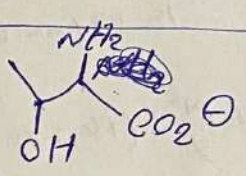
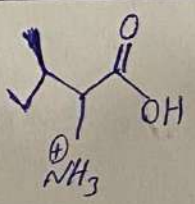
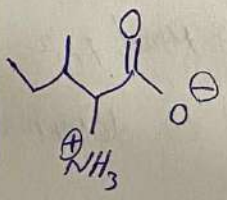
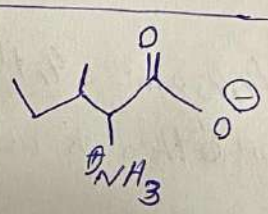
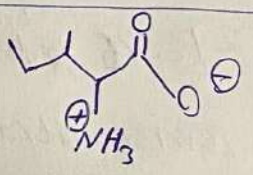
(9) 4) Thr  $pK_{a1} = 2,63$ $pK_{a2} = 10,43$

Ile  $pK_{a1} = 2,32$ $pK_{a2} = 9,67$

$$pK_{a_1} < PH < pK_{a_2}$$

PH	7.0	4.0	9.6	12.0
Thr				
Ile				

If PH = 9.6 every aminoacid $Pka_1 < PH < Pk_{a2}$ Consequently the Predominant from is zwitter ion

2) the threonine residue in the Protein binds to the drug by hydrogen bonds due to Presence of a hydroxyl group, and the is a leucine residue with an iso butyl substituent is capable only of interacting with London forces

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3) in Fig 3 we see that an important part of binding in the mutated fragment fragment is Provided by THR 319. As the PH increases, the nitrogen on the Preparation is deprotonated and the binding dappears.

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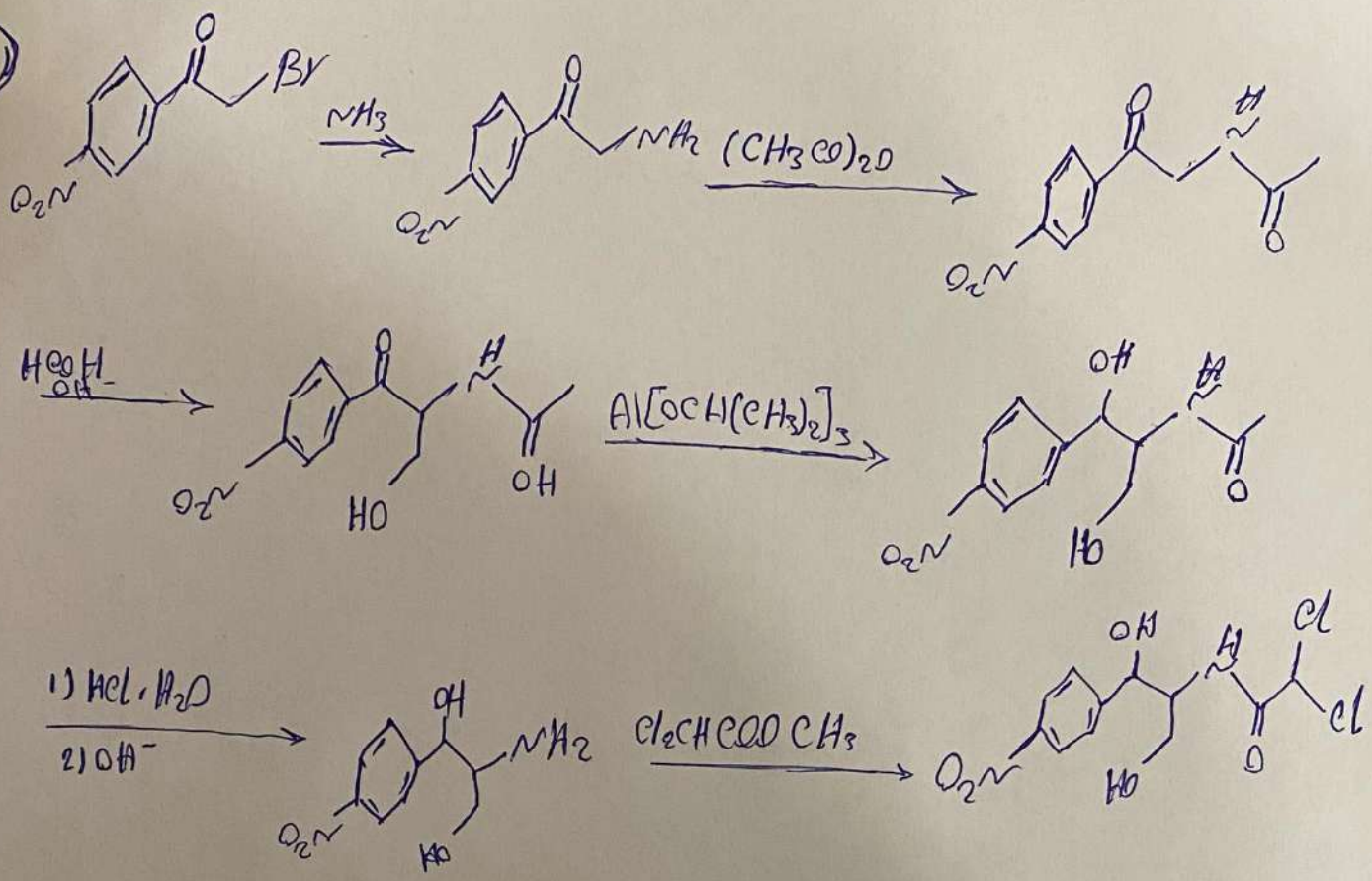
(5)



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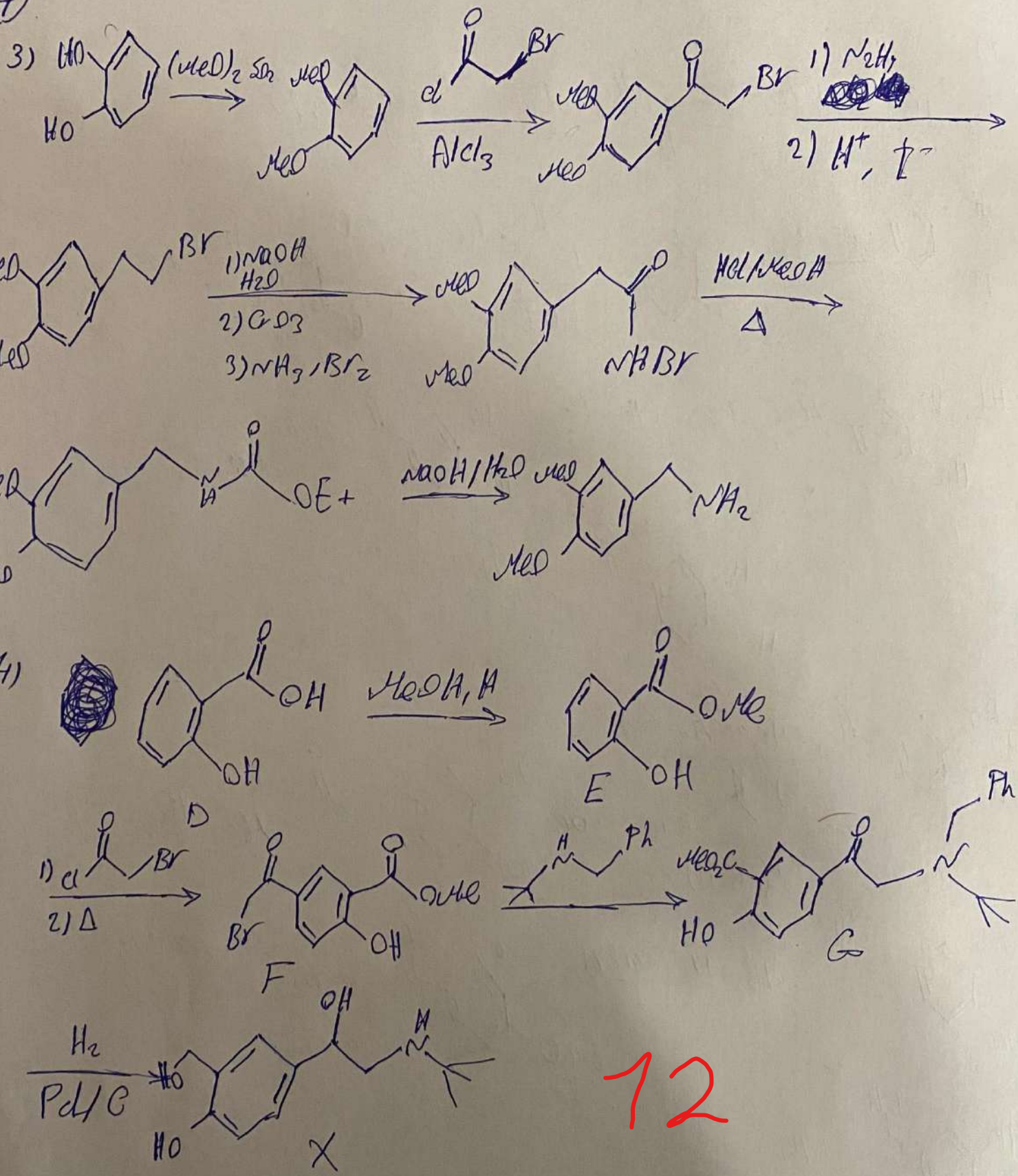
(4)



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