

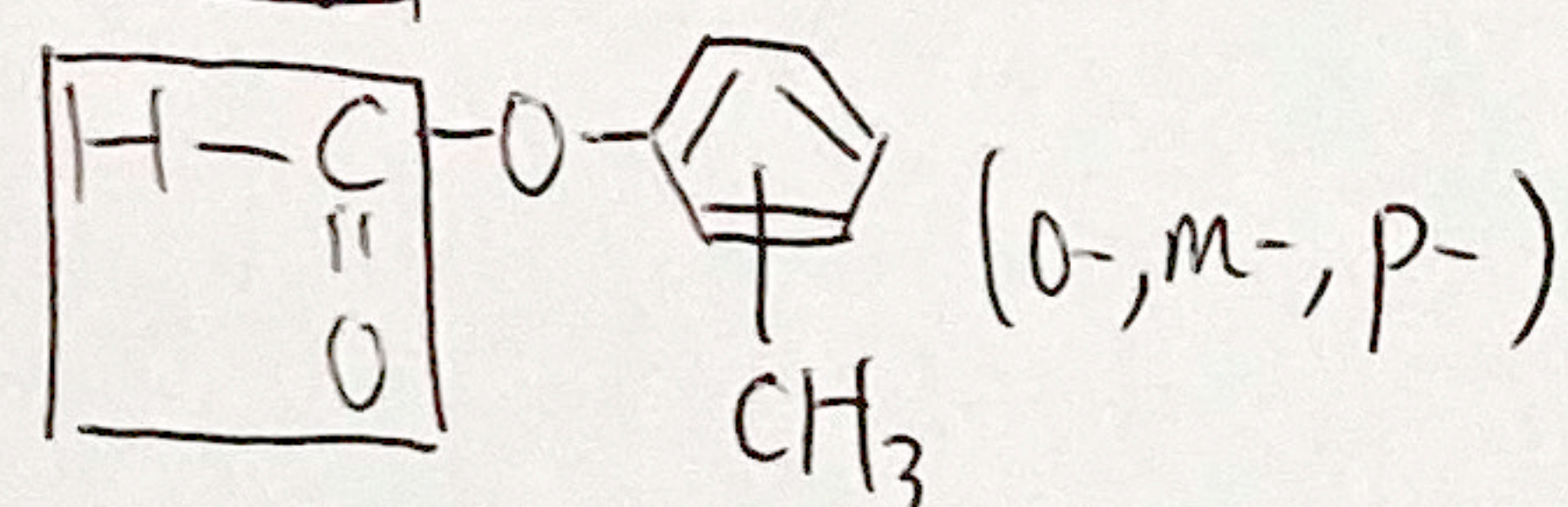
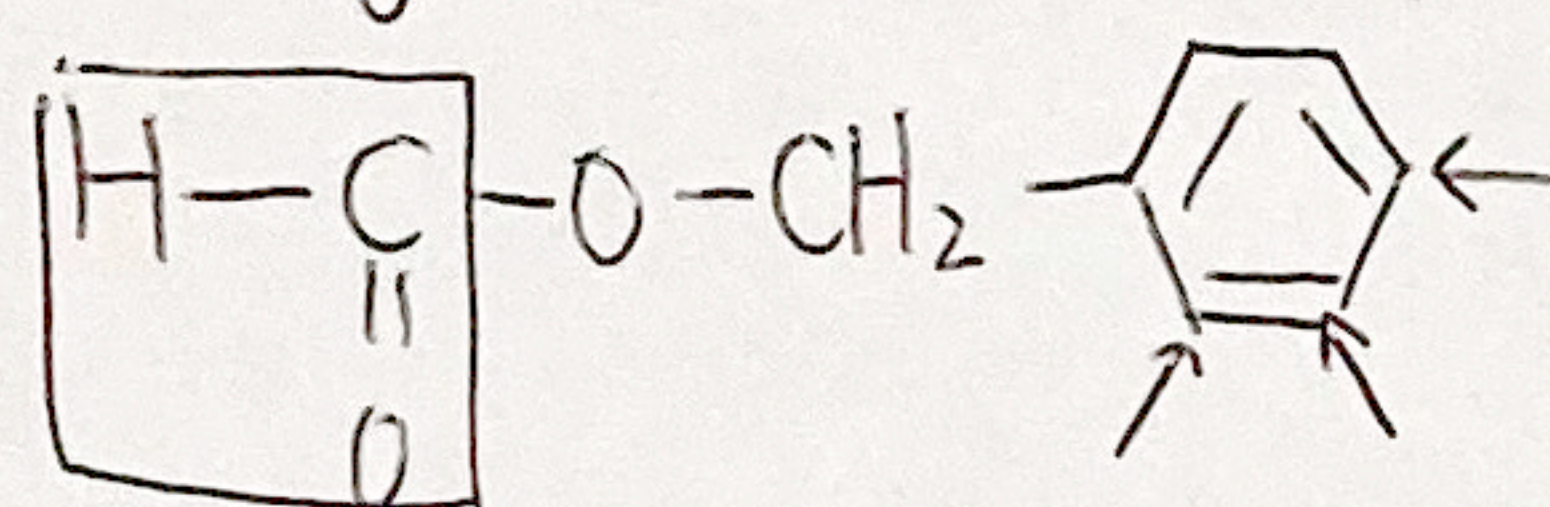
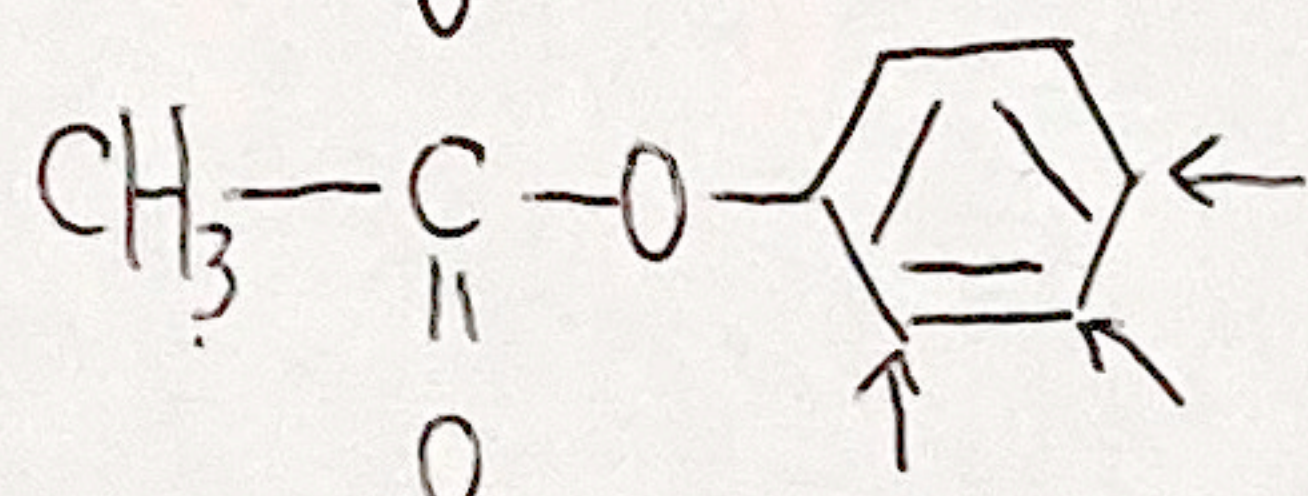
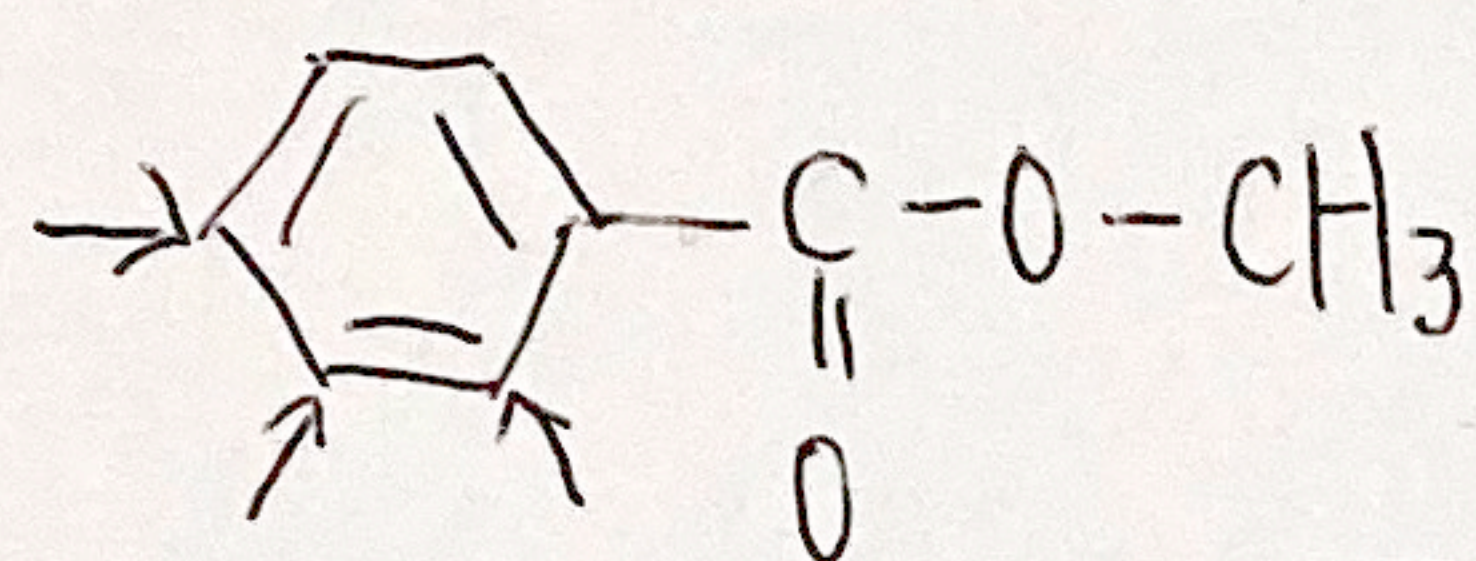
医学部専門予備校 クエスト 解答速報

昭和大学（医）化学

試験日 2月2日（金）



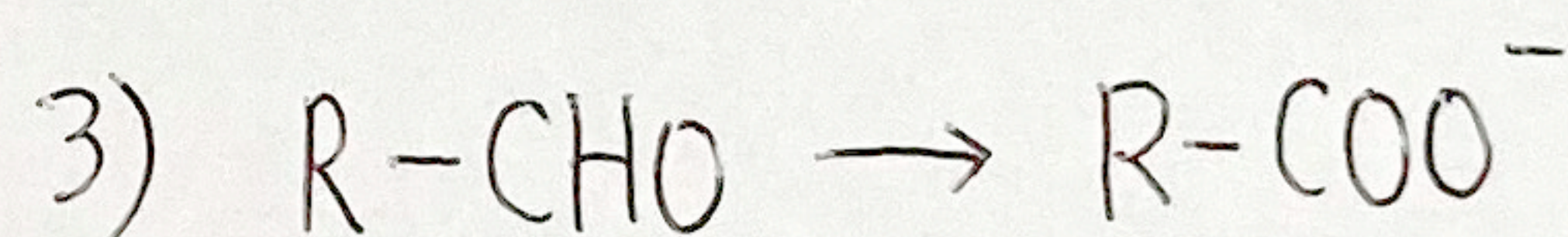
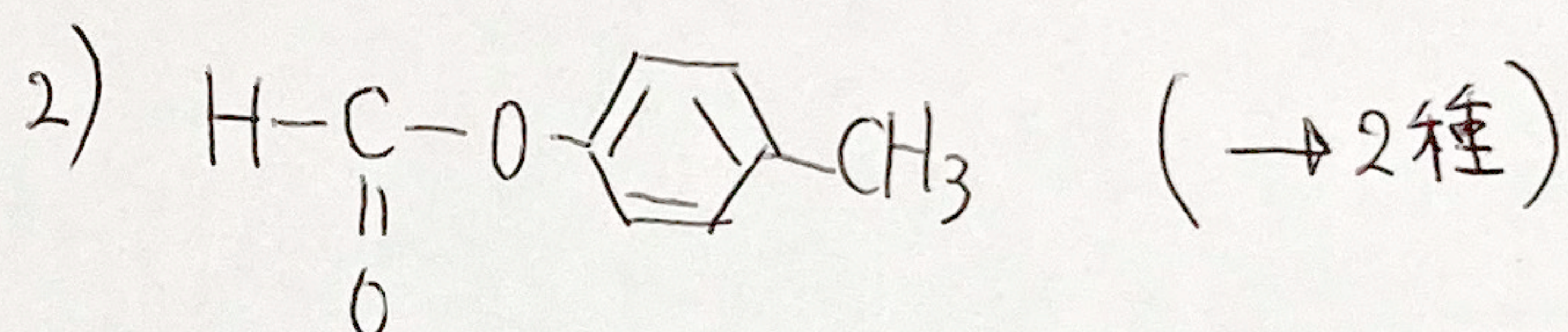
問1
1) $C_8H_8O_2$ 不飽和度 5



1) ア... 6

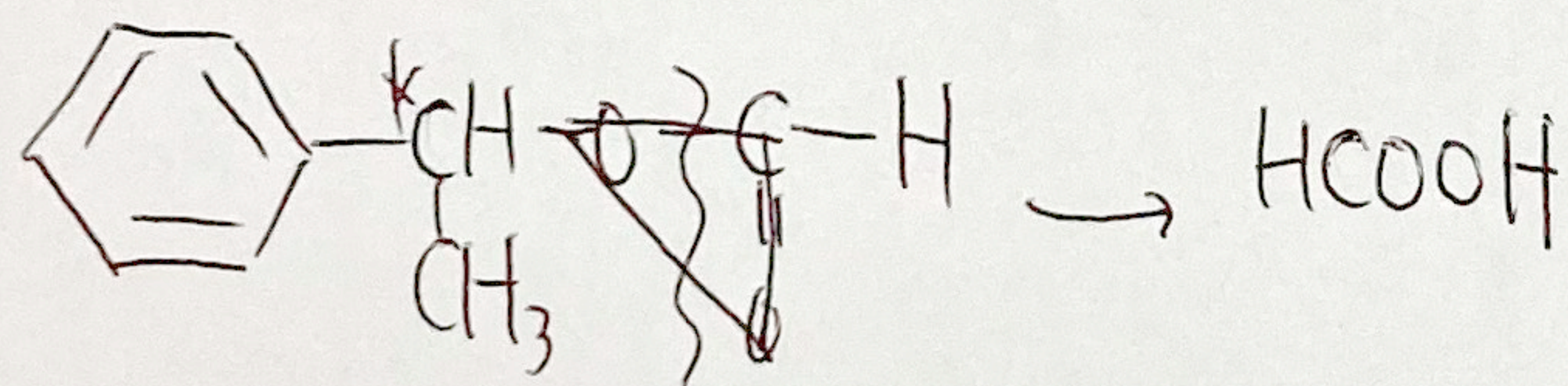
イ... 4

ウ... 0



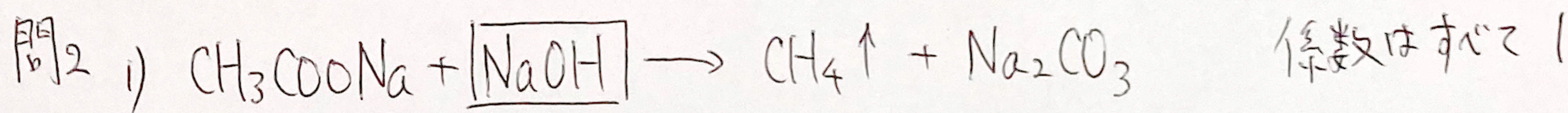
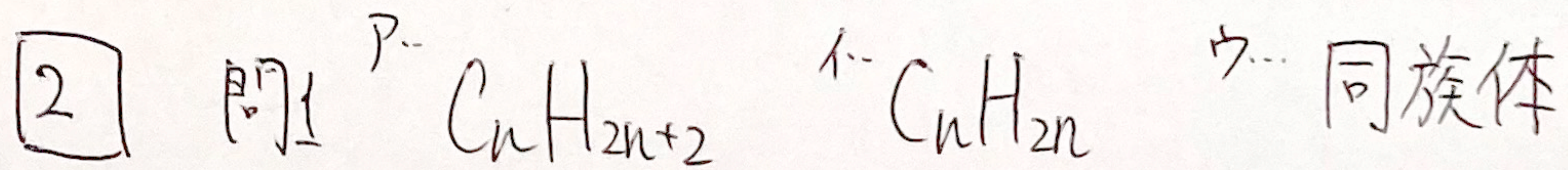
ア: モーア性 硝酸銀水溶液

問2 $C_9H_{10}O_2$ 不飽和度 5



1) キ" 酸, 0 個.

2) フェノール性ヒドロキシ基



A B
① ①

2) $CH_3COONa : \frac{10.0 \text{ g}}{82 \text{ g/mol}} = \frac{10}{82} \text{ mol}$

$NaOH : \frac{10}{82} \text{ mol} \times 40 \text{ g/mol} = \underline{4.88 \text{ g}}$

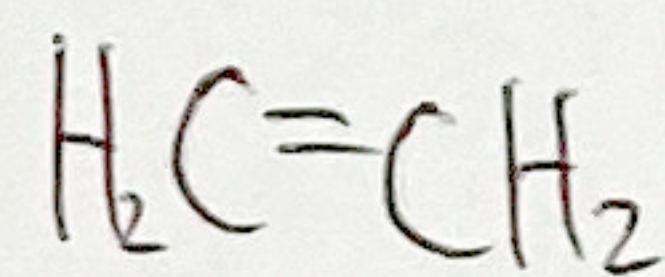
$CH_4 : \frac{2.50 \text{ L}}{22.4 \text{ L/mol}} = \frac{25}{224} \text{ mol}$

収率 = $\frac{\frac{25}{224} \text{ mol}}{\frac{10}{82} \text{ mol}} \times 100\% = \underline{91.5\%}$

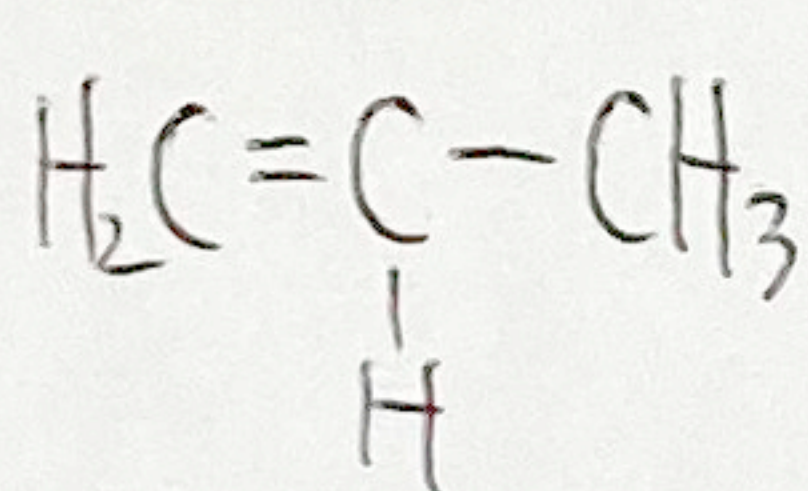
問3 4

問4

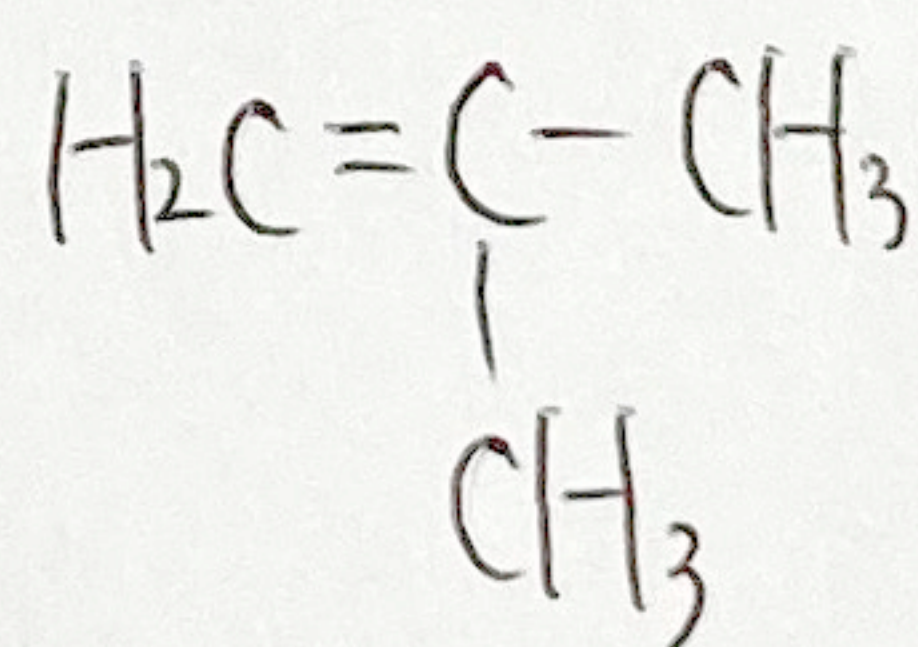
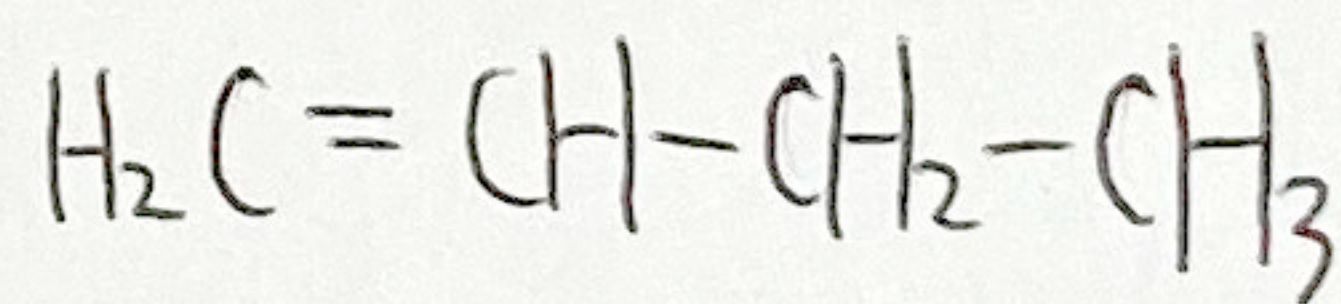
C_2



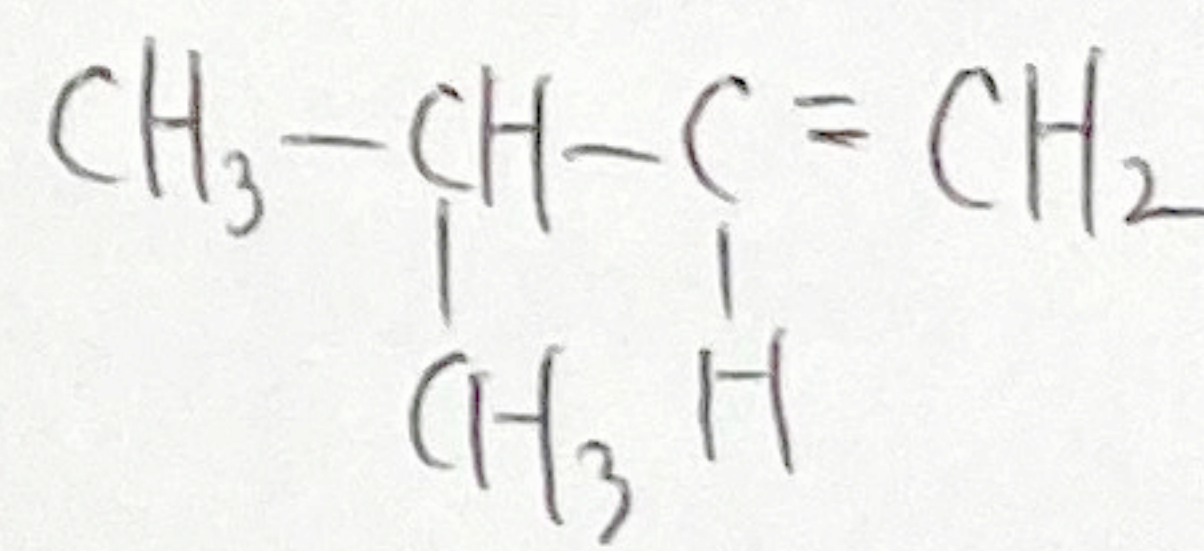
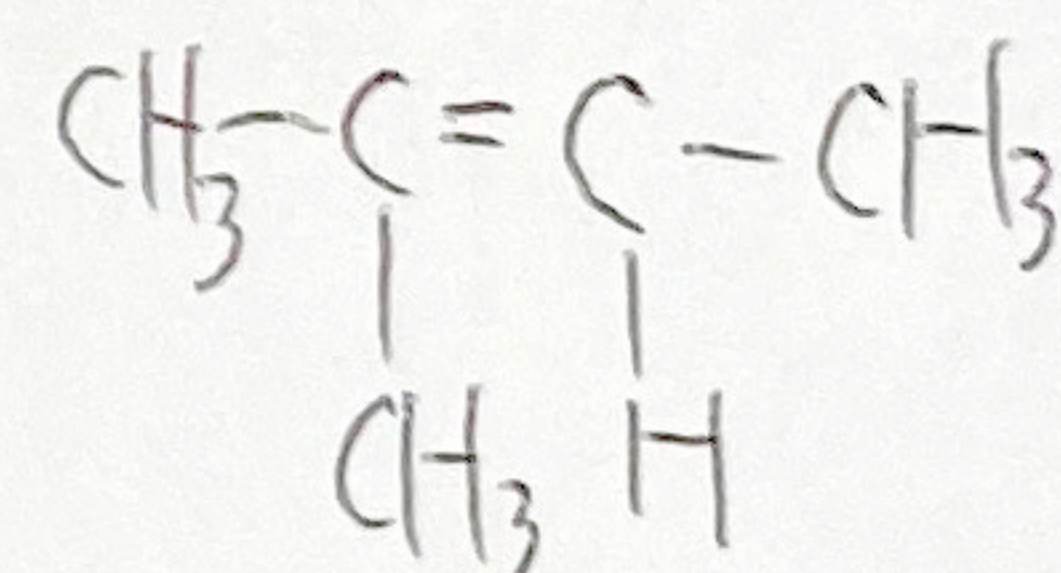
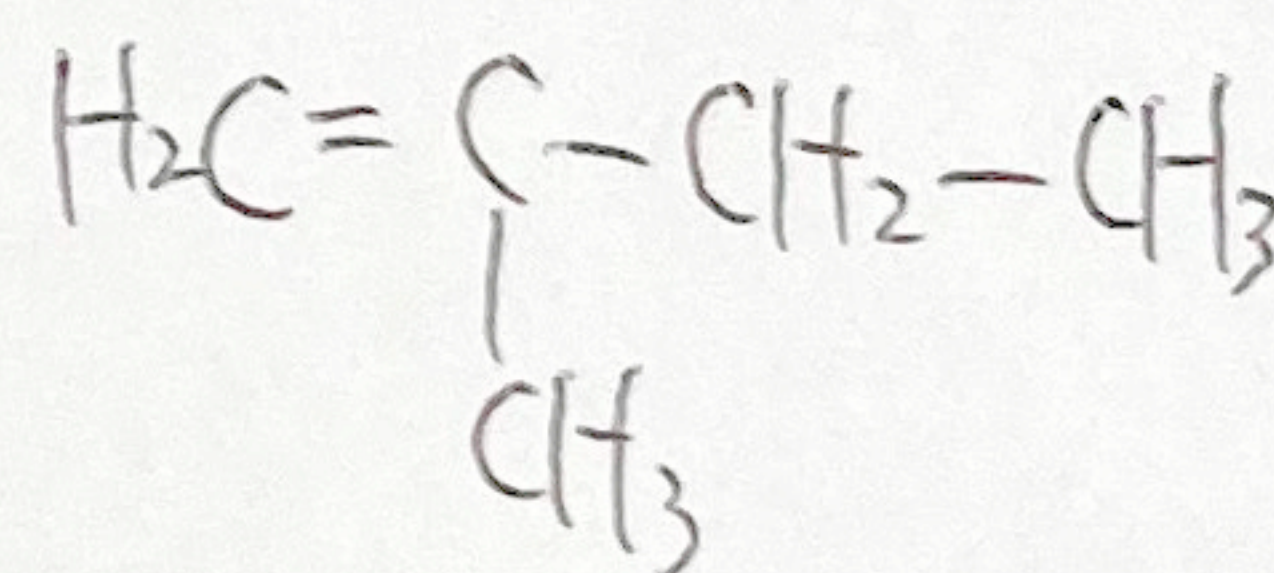
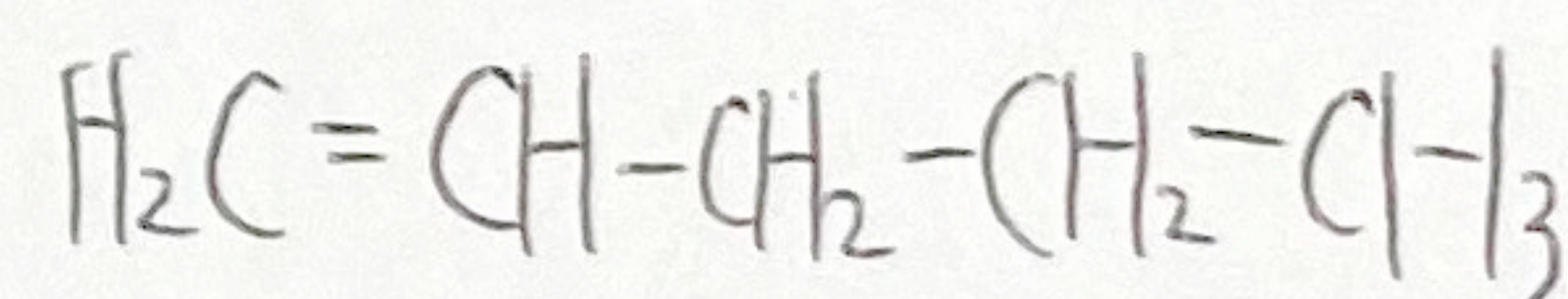
C_3



C_4

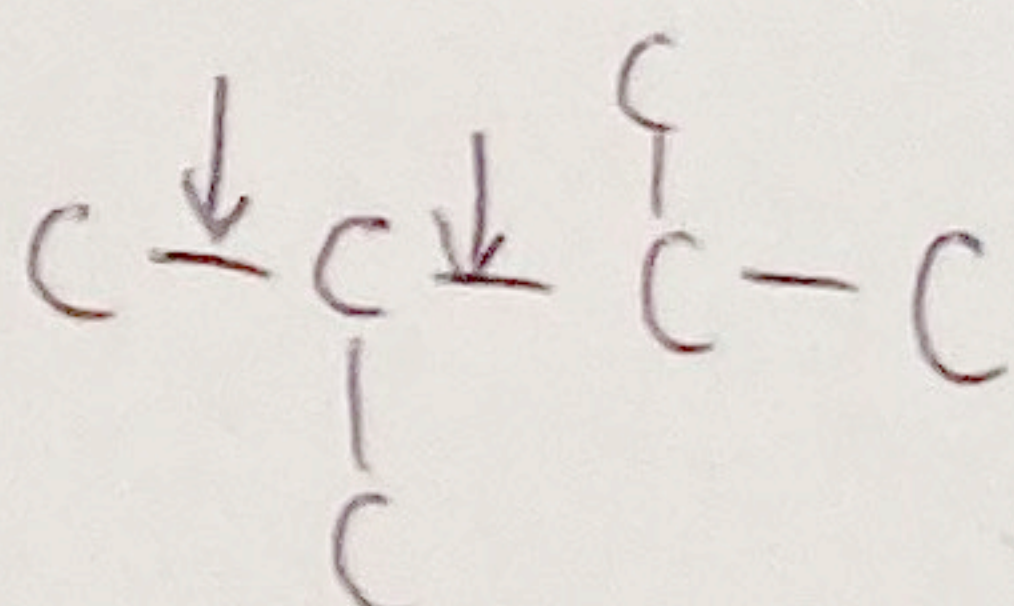
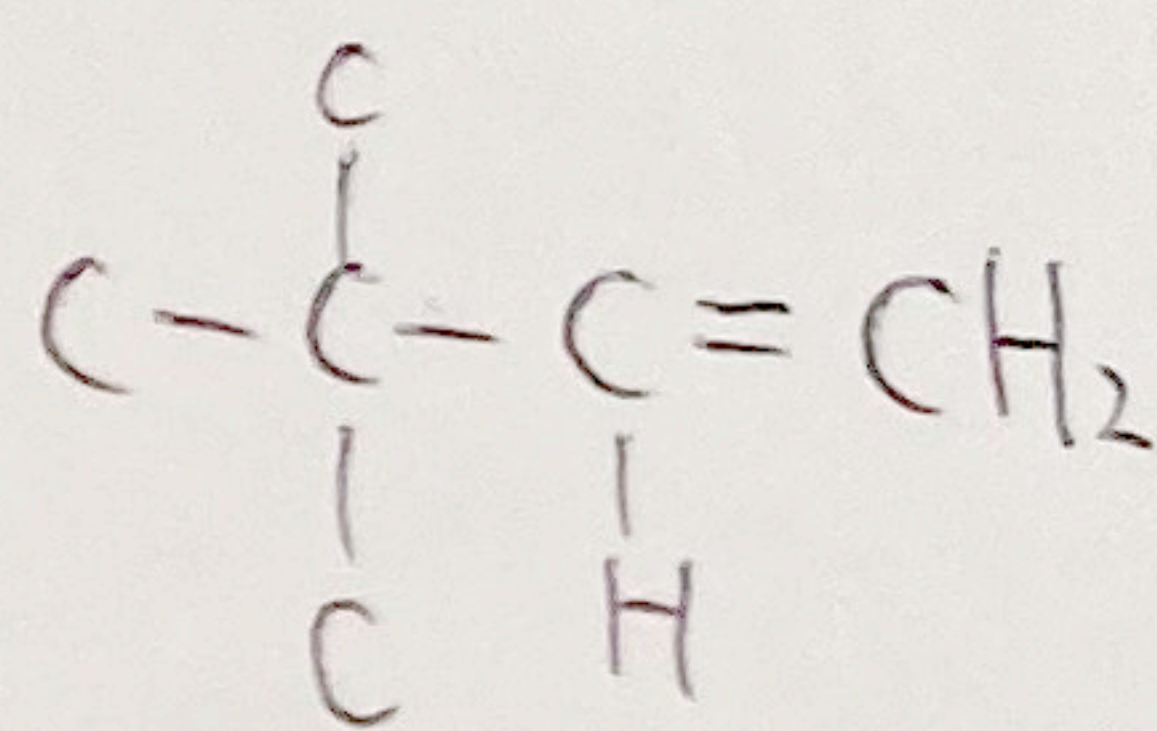
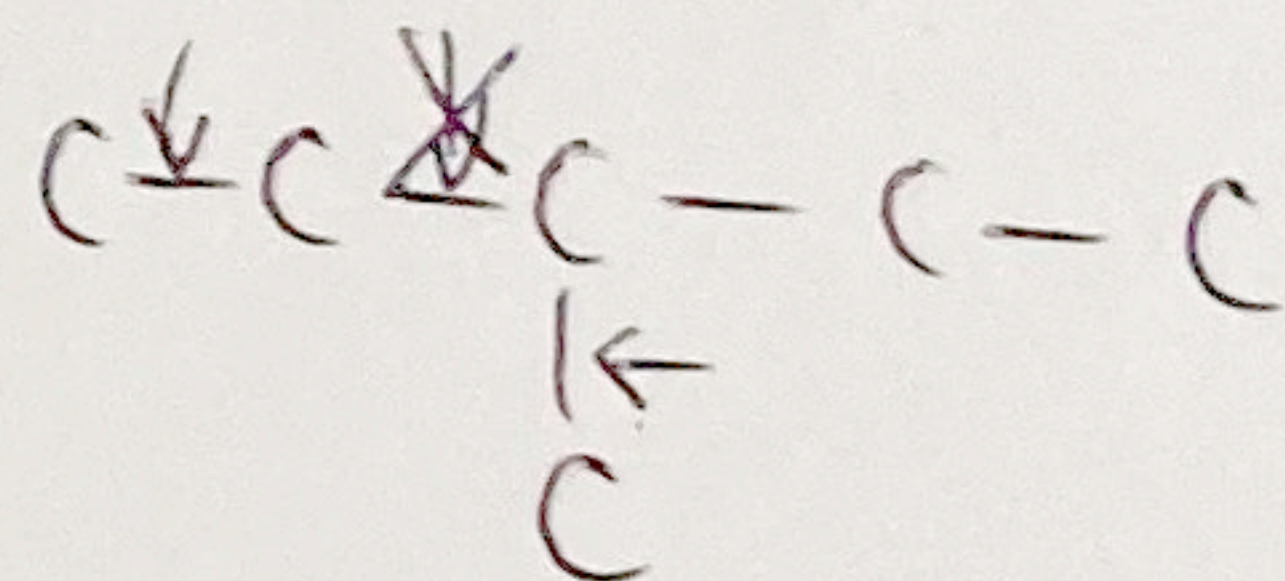
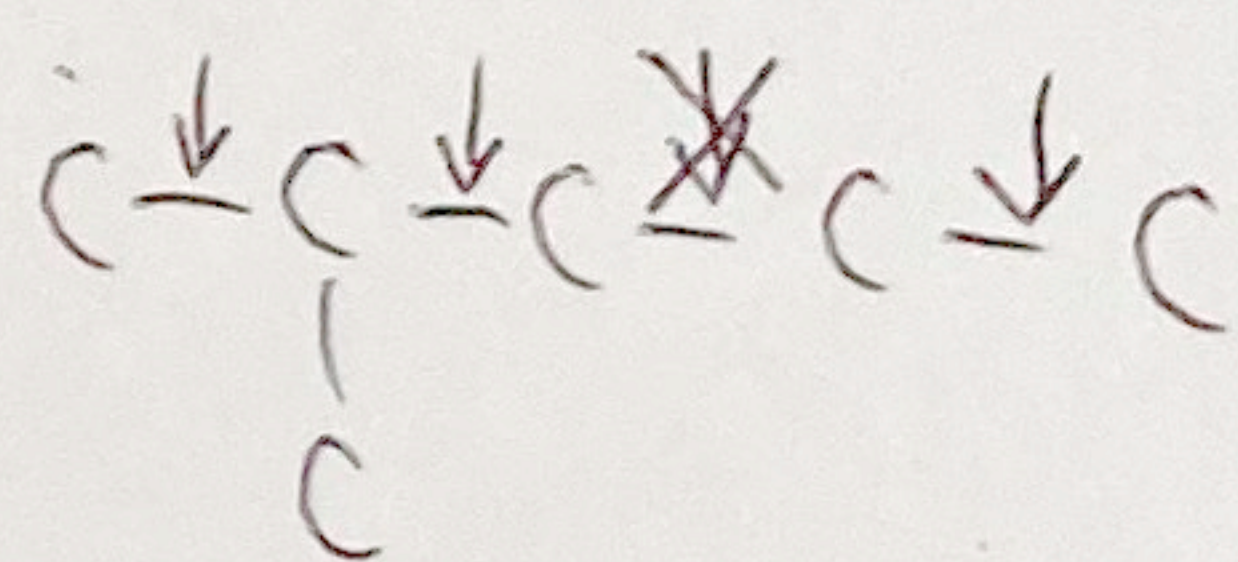
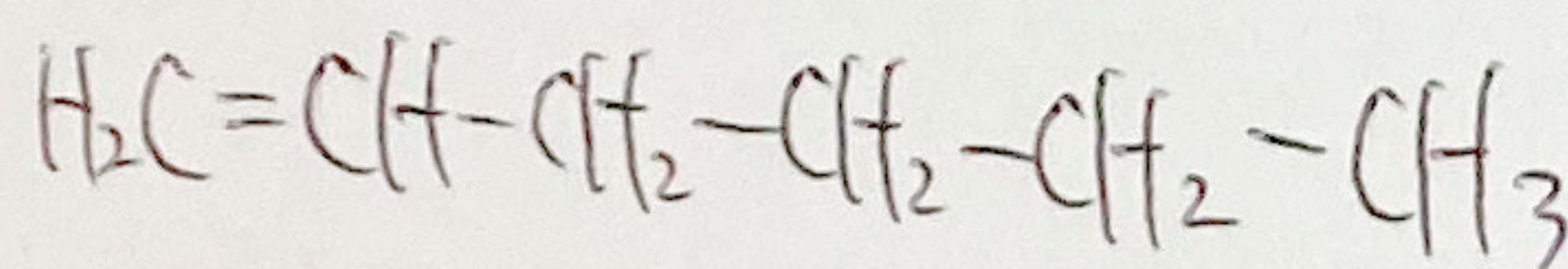


C_5



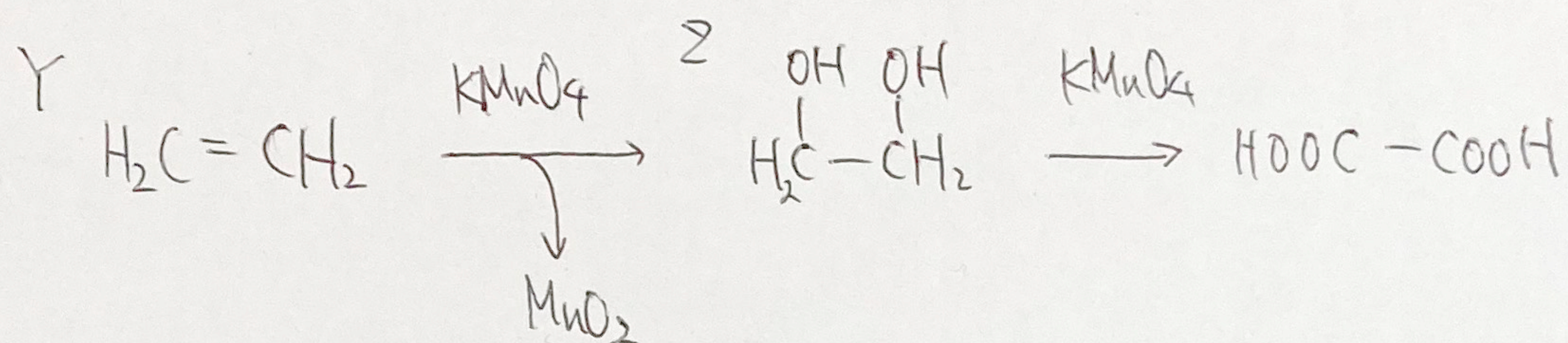
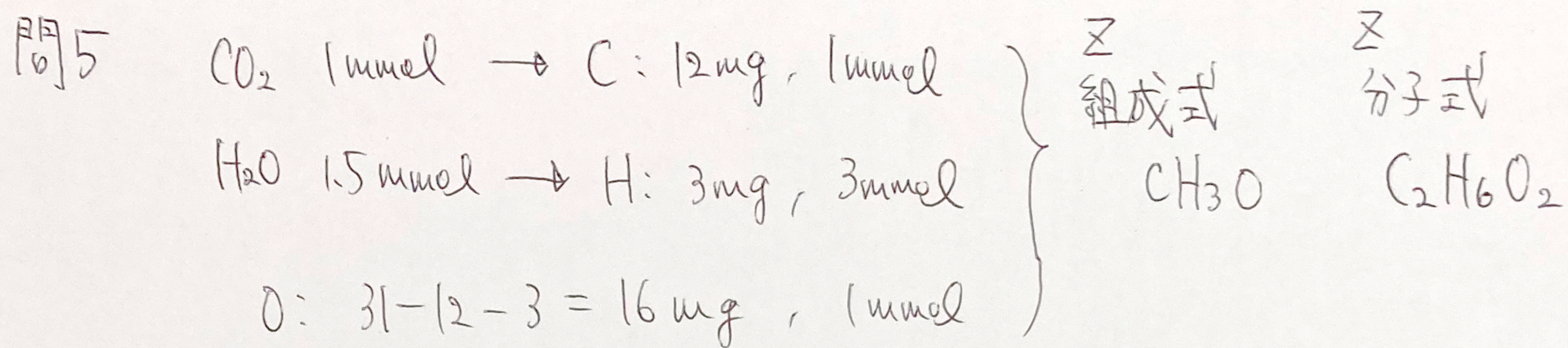
こゝまでが
8 種

C_6

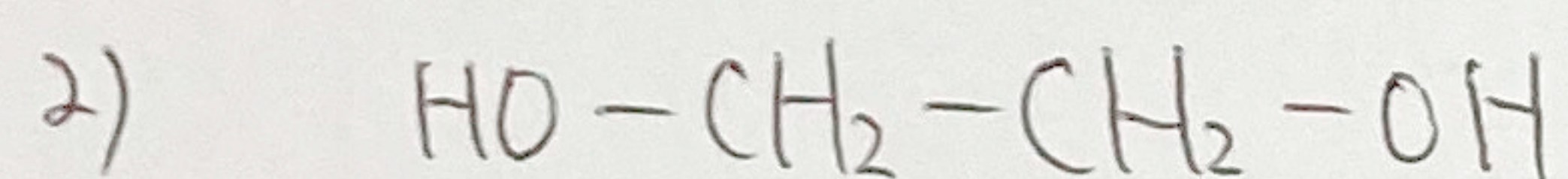


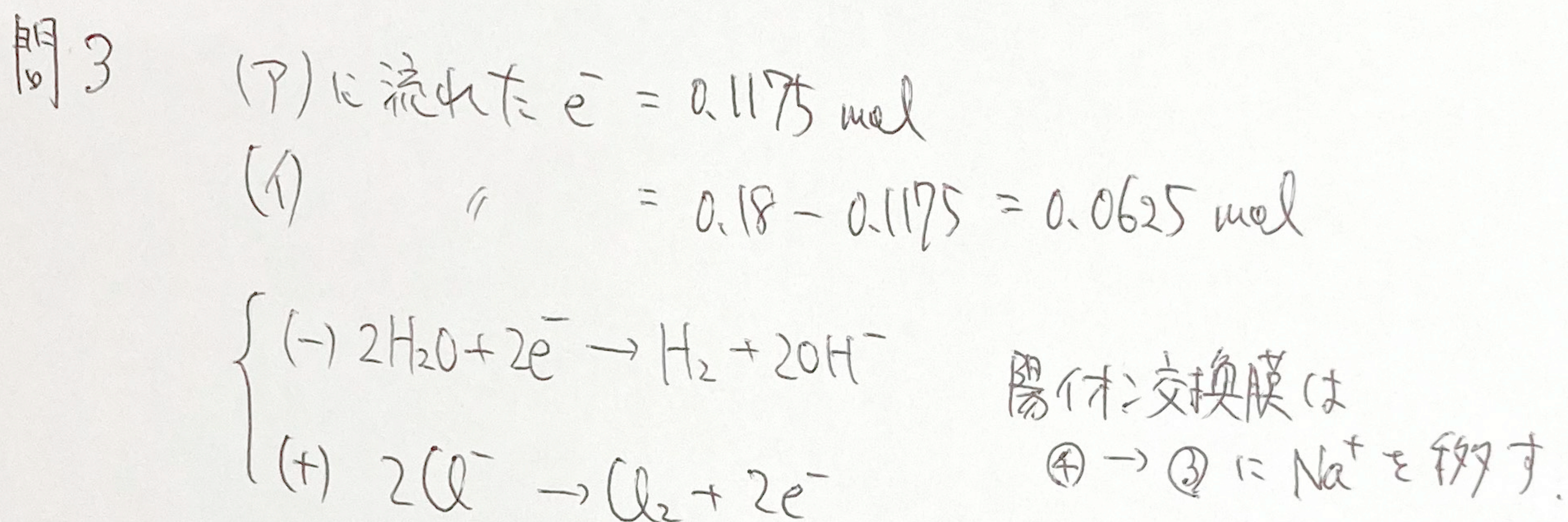
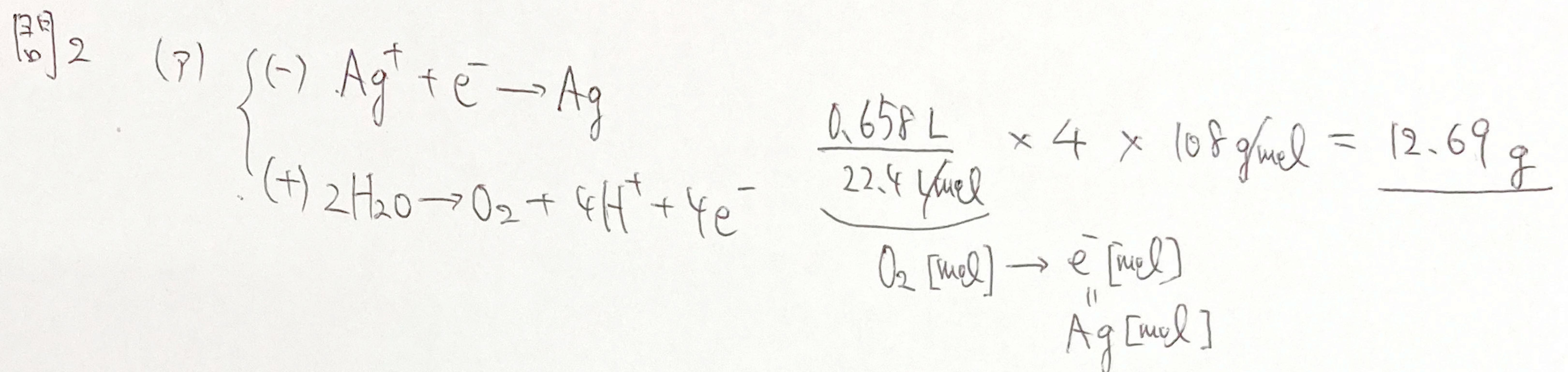
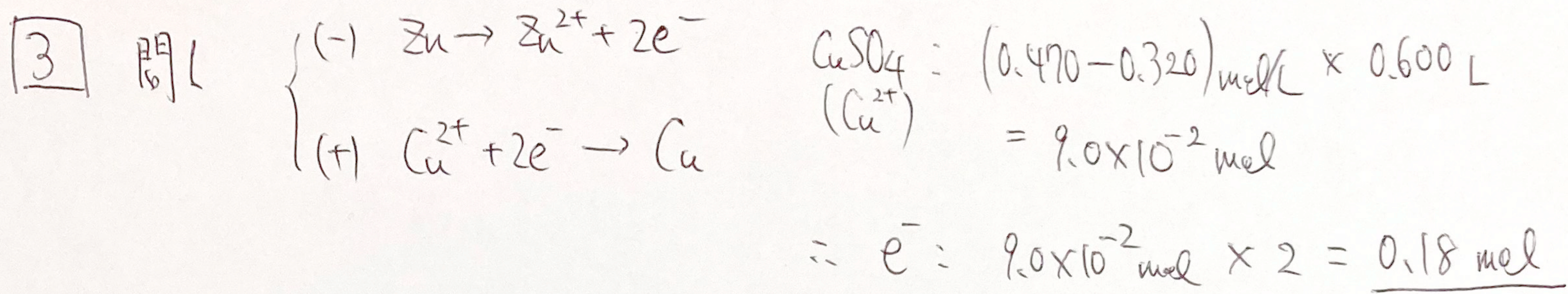
9 種

全 17 種

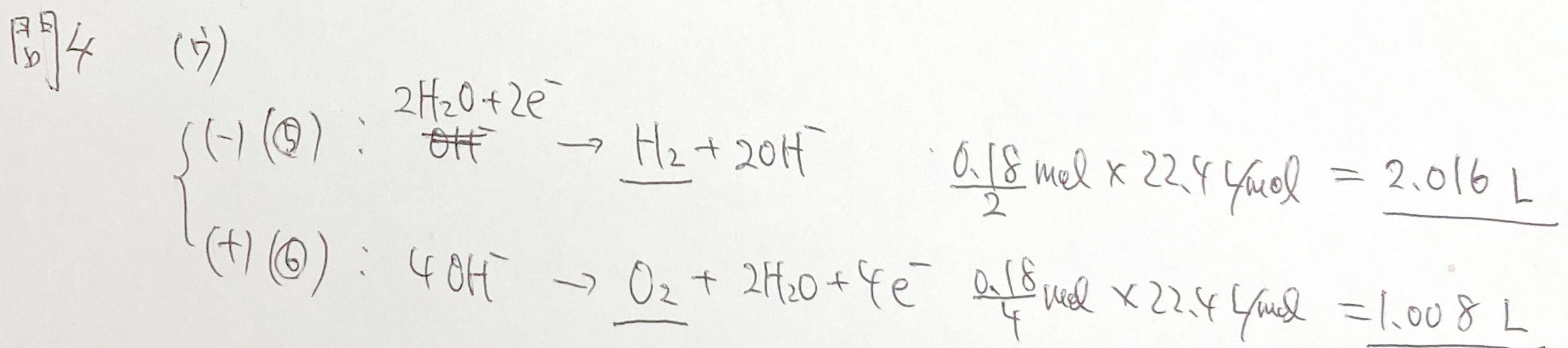


$$\left(\frac{4.98\text{g}}{0.401 \times 0.200\text{L}} \approx 62\text{g/mol} \text{ なる分子式 } \text{C}_2\text{H}_6\text{O}_2 \text{ 2"OK} \right)$$





$$[\text{OH}^-] = \frac{0.0625 \text{ mol}}{0.5 \text{ L}} = \frac{1}{8} \text{ mol/L} \quad \therefore \text{pH} = 14 - 3 \log_{10} 2 = \underline{13.1}$$



問1 $\text{Pa} \rightleftharpoons 2\text{B}$

前	p'	0	
変	$-x p'$	$+2x p'$	
後	$(1-x)p'$	$2x p'$	

全圧 $(1+x)p' = P$
 $(\therefore p' = \frac{1}{1+x} P)$

$$K_p = \frac{(2xp')^2}{(1-x)p'} = \frac{4x^2}{1-x} p' = \frac{4x^2}{1-x^2} P$$

$$\therefore 3.2 \times 10^4 = \frac{4x^2}{1-x^2} \cdot 1.2 \times 10^5$$

$$\therefore x = 0.25$$

問2 NaOH と反応する HCl : $\frac{0.035 \text{ mol/L} \times 70 \text{ mL}}{0.20 \text{ mol/L}} = 12.25 \text{ mL}$

第1中和点: NaOH と $\text{Na}_2\text{CO}_3 \rightarrow \text{NaHCO}_3$: $12.25 + 12.25 \times \frac{0.045}{0.035} = 28.00 \text{ mL}$

第2中和点: $\text{NaHCO}_3 \rightarrow \text{NaCl}$: $28 + 12.25 \times \frac{0.045}{0.035} = 43.75 \text{ mL}$

問3 $1 \text{ m}^3 = 10^3 \text{ L}$

30°C の水: $n_{\text{mol}} = \frac{(4.2 \times 10^3) \times 0.8 \text{ Pa} \times 10^3 \text{ L}}{R \cdot 303 \text{ K}}$

15°C の水: $n'_{\text{mol}} = \frac{1.7 \times 10^3 \text{ Pa} \times 10^3 \text{ L}}{R \cdot 288 \text{ K}}$

凝縮する水 $[\text{g}] = (n - n') \times 18 \text{ g/mol} = \frac{18 \times 10^6}{8.3 \times 10^3} \left(\frac{4.2 \times 0.8}{303} - \frac{1.7}{288} \right) \approx 11 \text{ g}$

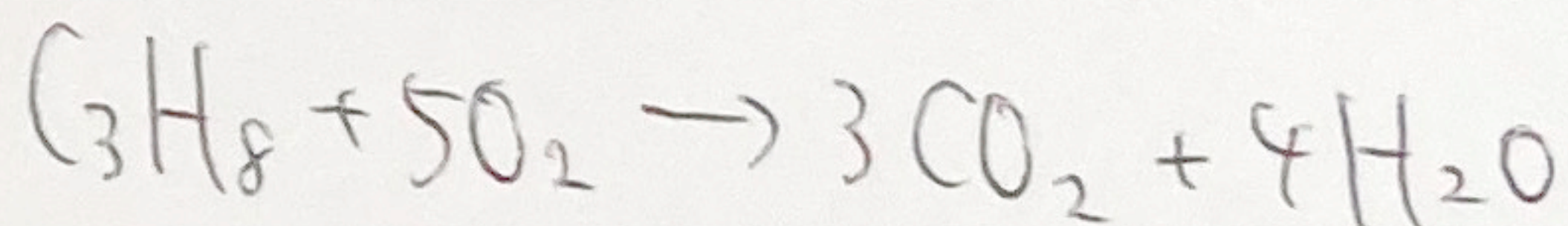
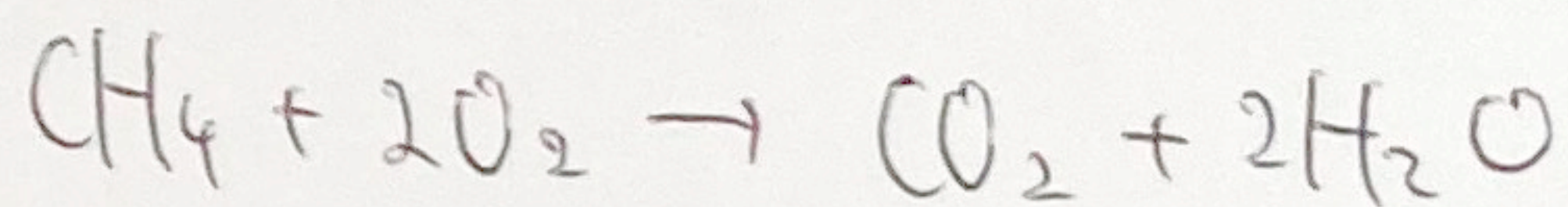
問4 $2.00 = 1.85 \times \frac{9.66 \text{ g}}{322 \text{ g/mol}} \times 3 \therefore x = 116.75 \text{ g}$

析出する水 8

電離 $\text{Na}^+, \text{SO}_4^{2-}$

問5 $x \text{ mol}$ と $y \text{ mol}$ とする。

$$\begin{cases} x + y = \frac{15.68}{22.4} \text{ (mol)} \\ 890x + 2220y = 889 \text{ (kJ)} \end{cases} \therefore \begin{cases} x = 0.50 \text{ mol} \\ y = 0.20 \text{ mol} \end{cases}$$



必要空気は

$$(2x + 5y) \times 22.4 \text{ L/mol} \times 5 = 224 \text{ L}$$