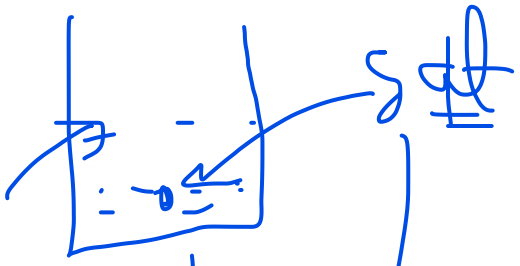


salt

Solvent

$NaCl \longrightarrow Na^{+} + Cl^{-}$

100.1.

Solute

Soln

Solute

Non- Electrolytes

Electrolyte

Strong

NaCl → $Na^+ + Cl^-$

Weak incom

$CH_3COOH \rightarrow CH_3COO^- + H^+$

$Na^+ + e^- \rightarrow Na^0$

Reduction

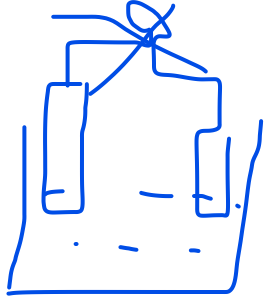
Cathode

$2Cl^- \rightarrow Cl_2 + 2e$

Oxd. rxn

Anode

non-electrolyte



CH_3CH_2OH

$HOCH_2CH_2OH$

CH_3-O-CH_3

Na^+Cl^-, K^+Cl^-

All ionic cpds ⟶ strong

HCl

Covalent cpds ⟶ weak

(Molecular) non-electrolyte

$$Al_2(SO_4)_3 \longrightarrow 2Al^{3+} + 3SO_4^{2-}$$

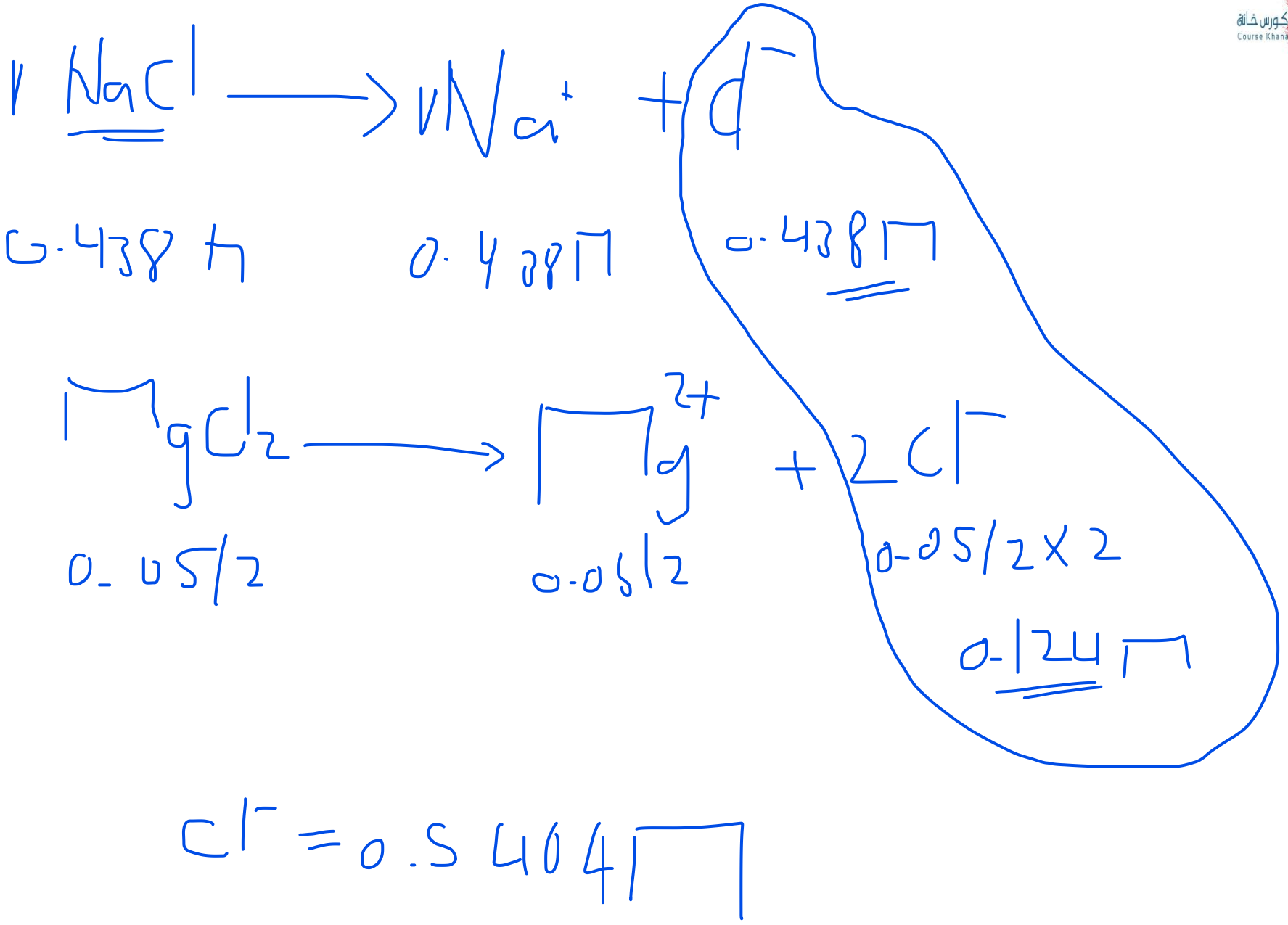
0.065 M

2 × 0.065 M

3 × 0.065 M

0.033 M

0.049 M


NaCl → Na+ + Cl−
0.438 M
0.438 M
0.438 M
MgCl2 → Mg2+ + 2Cl−
0.05/2
0.05/2
0.05/2 x 2
0.124 M
Cl− = 0.5404 M

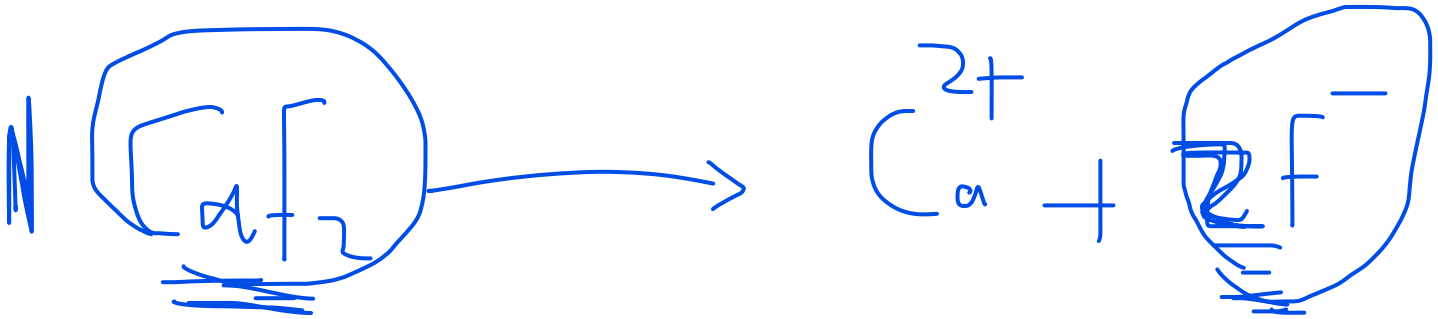
(a) $M = \dfrac{\text{no. of moles}}{V(l)} = \dfrac{\_\_\_\_\_\ \text{mol}}{\_\_\_\_\ \_\_\_\_\_ \times V(l)}$

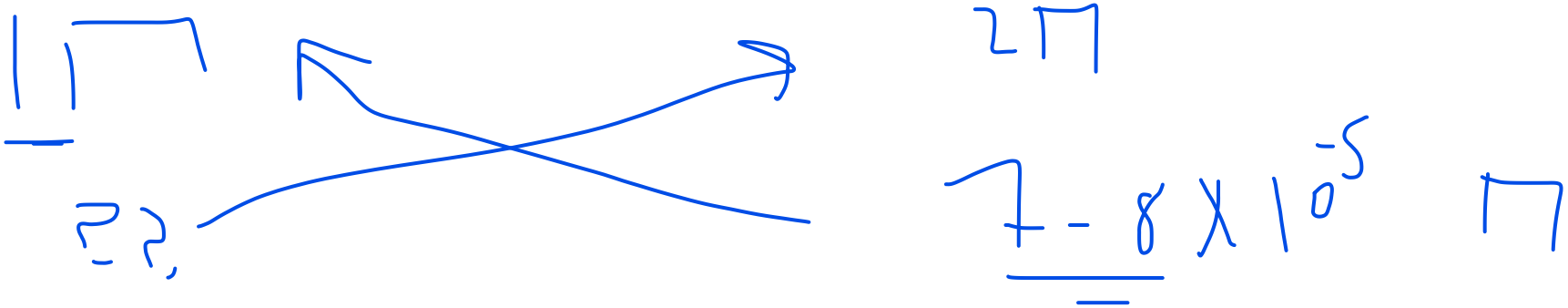
$M(F) = \dfrac{1.5 \times 10^{-3}}{19 \times 1} = 7.89 \times 10^{-5}\ M$

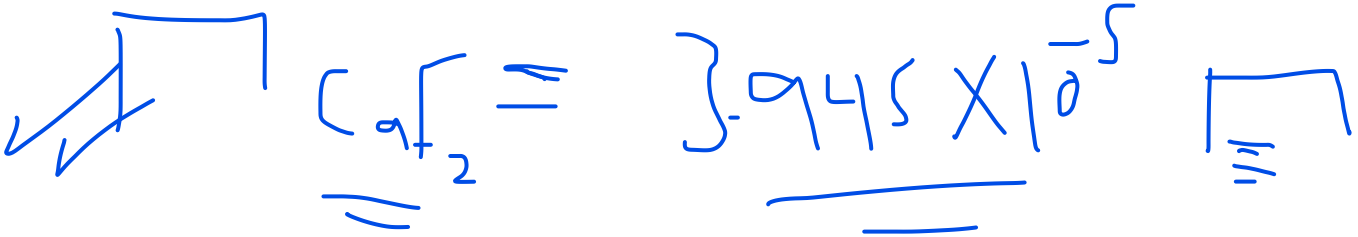
Calcium fluoride CaF_2

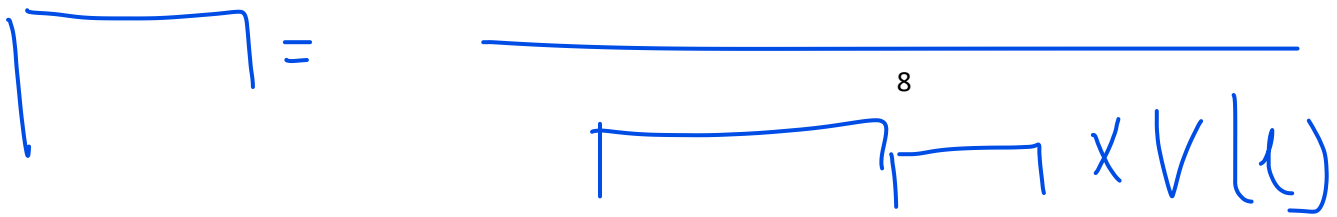
Ca F

2 1









$$3.945 \times 10^{-5} \times \frac{\text{Mass}}{[40 + (2 \times 19)] \times 1 \times 10^{6}}$$

weak COOH

CO

OH

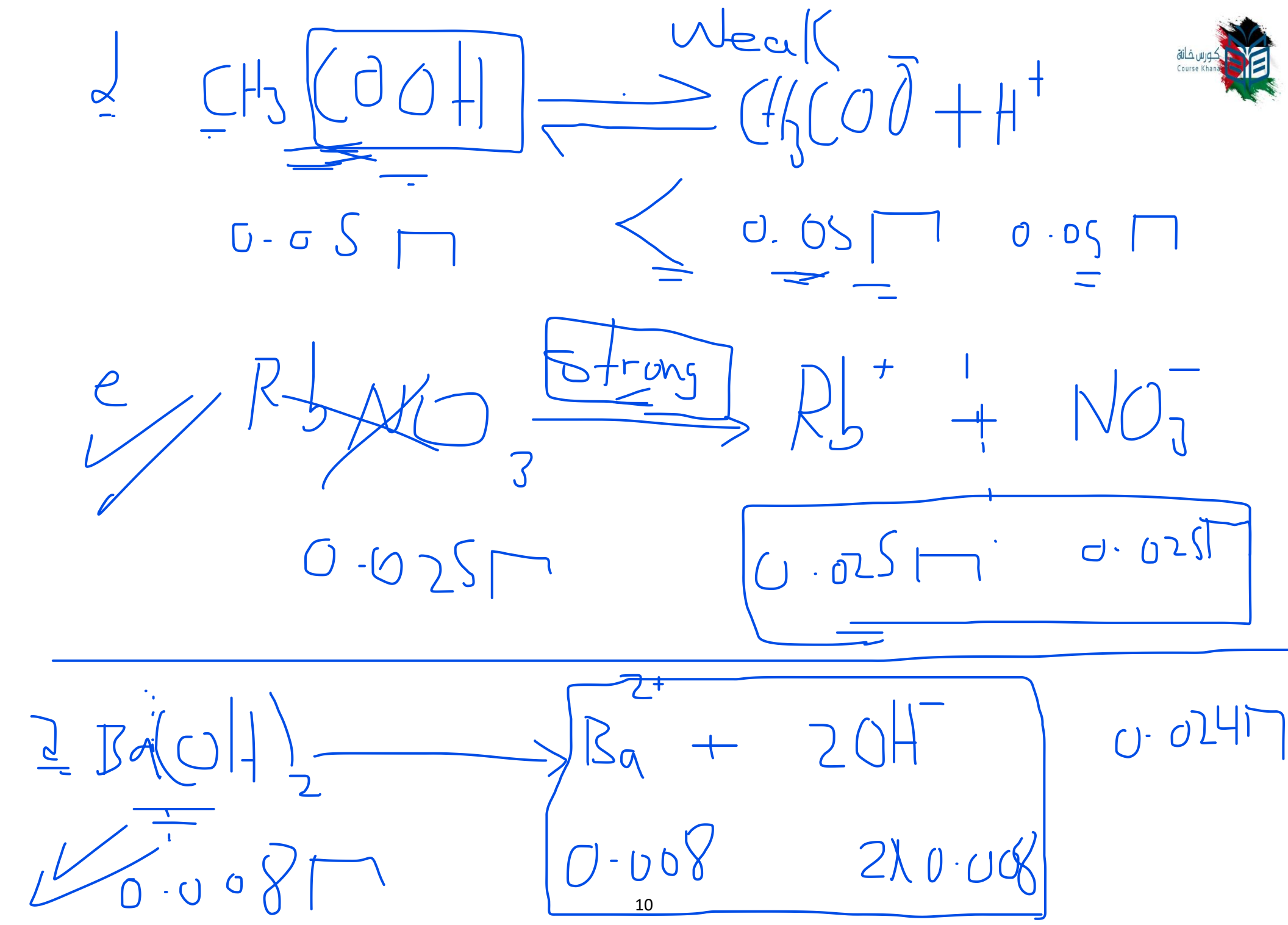
O

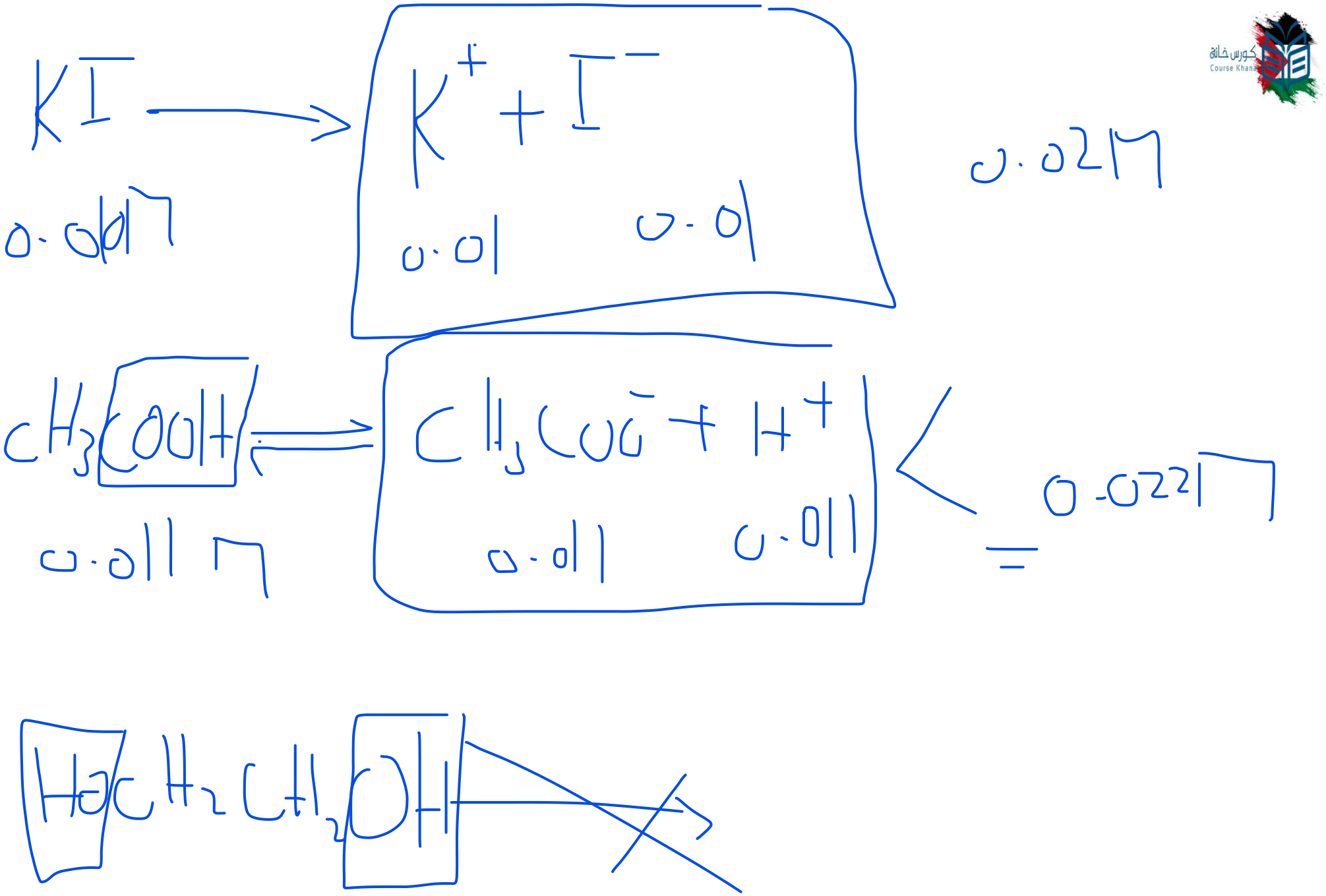
Mass = 3077 g

a) CH_3COCH_3 → ✗

b) CH_3CH_2OH → ✗

c) $CH_2OHCHOHCH_2OH$ → ✗


weak
strong
10


KI
K+ + I−
0.05M
0.01
0.01
0.02M
CH3COOH
CH3COO− + H+
0.11 M
0.01
0.01
0.022M
H3CH2CH2OH

$Al_2(SO_4)_3 \longrightarrow Al^{3+} + 3SO_4^{2-}$

0.004

2×0.004 3×0.004

0.02

Ppt

$A + B \longrightarrow ppt$

H_2O

$AgNO_3 + Cl^- \longrightarrow NO_3^- + AgCl\downarrow$

$AgNO_3 \longrightarrow$ Ve

→ Na^+, K^+, Rb^+, Cs^+, NH_4^+, CH_3COO^-, NO_3^-

soluble

NH_4OH

→ Hg^{2+}, Pb^{2+}, Ag^+

insoluble

→ Cl^-, Br^-, I^-

soluble

insoluble

→ OH^-, CO_3^{2-}, S^{2-}, PO_4^{3-}, SO_4^{2-}

soluble

Ba^{2+} Pb^{2+} Ca^{2+}

Aluminium chloride + Pot. hydroxide ⟶

Pot. Chloride + Aluminium hydroxide

$$AlCl_3(aq) + 3KOH(aq) \longrightarrow 3KCl(aq) + Al(OH)_3(s)$$

Ionic eqn

$$Al^{3+}_{(aq)} + 3Cl^-_{(aq)} + 3K^+_{(aq)} + 3OH^-_{(aq)} \longrightarrow 3K^+_{aq} + 3Cl^-_{aq} +$$

$Al(OH)_3(s)$

$$Al^{3+}_{aq} + 3OH^-_{aq} \longrightarrow Al(OH)_{3(s)}$$

//

Net eqn

$$2NaOH_{(aq)} + MgCl_{2(aq)} \longrightarrow \underset{2\times1}{2NaCl_{(aq)}} + \underset{1\times2}{Mg(OH)_{2(s)}}\downarrow$$

$$2Na^{+}_{aq} + 2OH^{-}_{aq} + Mg^{2+}_{aq} + 2Cl^{-}_{aq} \rightarrow 2Na^{+}_{aq} + 2Cl^{-}_{aq} + Mg(OH)_{2(s)}\downarrow$$

Net ionic

$$2OH^{-}_{aq} + Mg^{2+}_{aq} \longrightarrow Mg(OH)_{2(s)}\downarrow$$

$$BaS_{(aq)} + CuSO_{4(aq)} \longrightarrow BaSO_{4(s)} + CuS_{(s)}$$

$$Ba^{2+}_{aq} + S^{2-}_{aq} + Cu^{2+}_{aq} + SO_4^{2-}{}_{aq} \longrightarrow Ba^{2+}_{aq} + SO_4^{2-}{}_{aq} + CuS_{(s)}$$

$$S^{2-}_{aq} + Cu^{2+}_{aq} \longrightarrow CuS_{(s)}$$

* $(NH_4)_2SO_4 + ZnCl_2 \longrightarrow 2NH_4Cl + ZnSO_4$

$(aq) \quad (aq) \quad (aq) \quad (s)$

$2NH_4^+ + SO_4^{2-} + Zn^{2+} + 2Cl^- \rightarrow 2NH_4^+ + 2Cl^- + ZnSO_4\downarrow$

$aq \quad (aq) \quad aq \quad aq \quad aq \quad aq \quad (s)$

$SO_4^{2-} + Zn^{2+} \rightarrow ZnSO_4\downarrow$

$aq \quad aq \quad (s)$

$$AlCl_{3(aq)} + 3KOH_{(aq)} \rightarrow Al(OH)_{3(s)}\downarrow + 3KCl_{(aq)}$$

$$Al^{3+}_{(aq)} + 3Cl^-_{(aq)} + 3K^+_{(aq)} + 3OH^-_{(aq)} \rightarrow 3K^+ + 3Cl^- + Al(OH)_{3(s)}$$

$$Al^{3+}_{(aq)} + 3OH^-_{(aq)} \rightarrow Al(OH)_{3(s)}\downarrow$$

$$3K_2SO_{4(aq)} + 2FeBr_{3(aq)} \longrightarrow 6KBr_{(aq)} + Fe_2(SO_4)_{3(s)}$$

$$6K^+_{(aq)} + 3SO_4^{2-}{}_{(aq)} + 2Fe^{3+}_{(aq)} + 6Br^-_{(aq)} \rightarrow 6K^+_{(aq)} + 6Br^-_{(aq)} + Fe_2(SO_4)_{3(s)}$$

$$3SO_4^{2-}{}_{(aq)} + 2Fe^{3+}_{(aq)} \longrightarrow Fe_2(SO_4)_{3(s)}$$

$$CaI_{2(aq)} + Pb(NO_3)_{2(aq)} \longrightarrow Ca(NO_3)_{2(aq)} + PbI_{2(s)}$$

2 × 1 — 2 × 1

$$Ca^{2+}_{aq} + 2I^-_{aq} + Pb^{2+}_{aq} + 2NO^-_{3\,aq} \longrightarrow Ca^{2+}_{aq} + 2NO^-_{3\,aq} + PbI_{2(s)}$$

$$2I^-_{aq} + Pb^{2+}_{aq} \longrightarrow PbI_{2(s)}$$

$$Na_3PO_4 + AlCl_3 \longrightarrow NaCl + AlPO_4$$

(aq) (aq) (aq) (s)

$$3Na^+ + PO_4^{3-} + Al^{3+} + 3Cl^- \longrightarrow 3Na^+ + 3Cl^- + AlPO_4$$

(aq) (aq) (aq) (aq) (s)

$$PO_4^{3-} + Al^{3+} \longrightarrow AlPO_4$$

(s)

$$Al_2(SO_4)_3 + 3Ba Cl_2 \rightarrow 2AlCl_3 + 3BaSO_4$$

$$Al_2(SO_4)_{3(s)} + 3Ba^{2+}_{(aq)} + 6Cl^-_{(aq)} \rightarrow 2Al^{3+}_{(aq)} + 6Cl^-_{(aq)} + 3Ba^{2+}_{(aq)} + 3SO_4^{2-}$$

$$Al_2(SO_4)_{3(s)} \downarrow \longrightarrow 2Al^{3+}_{(aq)} + 3SO_4^{2-}{}_{(aq)}$$

$$(NH_4)_2CO_3 + Pb(NO_3)_2 \rightarrow 2NH_4NO_3 + PbCO_3 \downarrow$$

$$1 \times 2 \quad 2 \times 1 \quad 1 \times 1 \quad 1 \times 1$$

$$2NH_4^+ + CO_3^{2-} + Pb^{2+} + 2NO_3^- \rightarrow 2NH_4^+ + 2NO_3^- + PbCO_3 \downarrow$$

$$CO_3^{2-}(aq) + Pb^{2+}(aq) \longrightarrow PbCO_3(s)$$