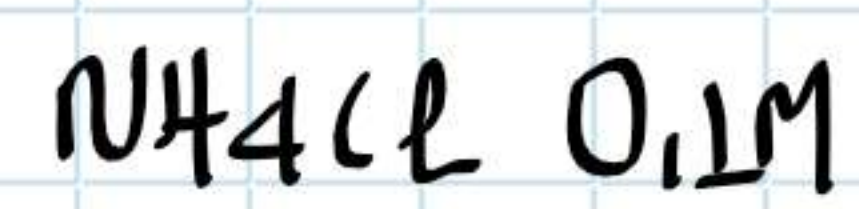
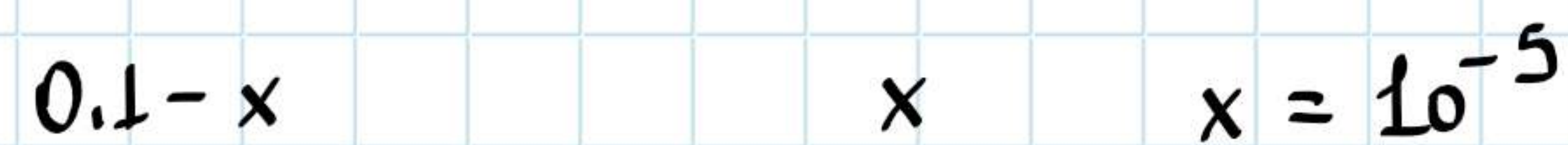
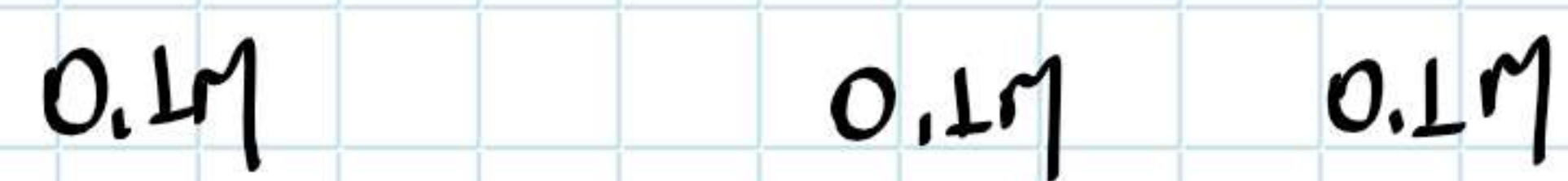


-Άσκηση 10.18.

α) Δ₁

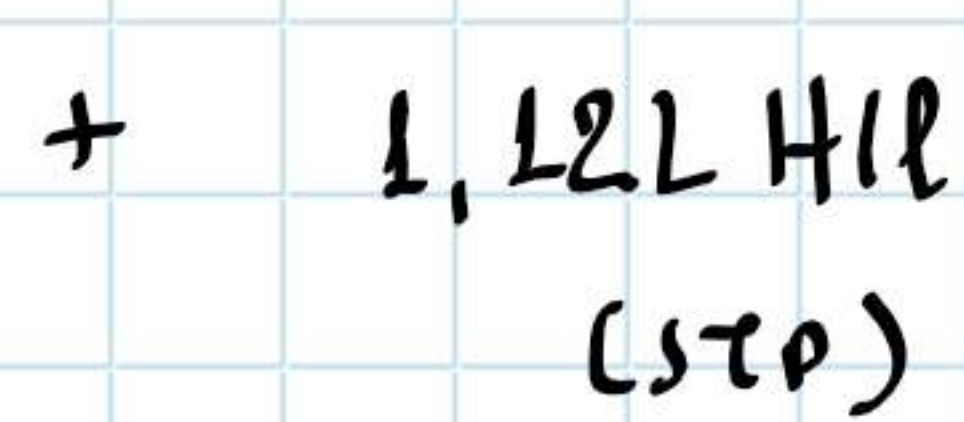
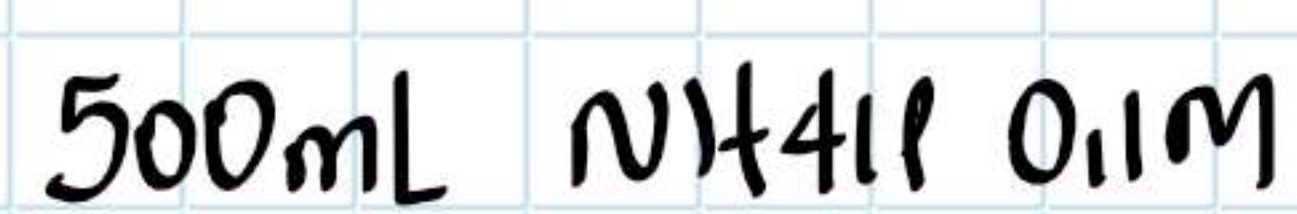


$$\text{pH} = 5$$

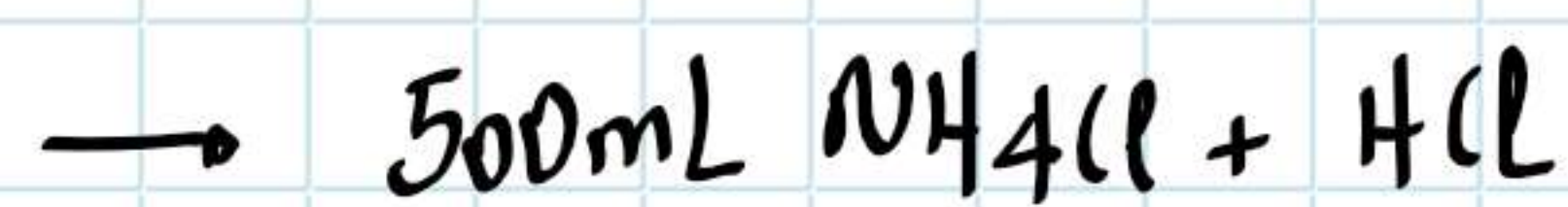


$$K_a = \frac{x^2}{0,1 - x} \approx \frac{x^2}{0,1} \Rightarrow K_a = 10^{-9} \quad \text{και} \quad K_b = 10^{-5}$$

β) Δ₁



(στερ)



(άλλες (ικανό στί)
από. βάσης)

Δ₂

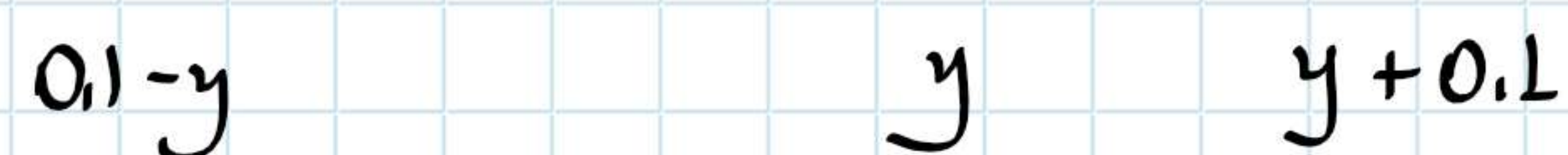
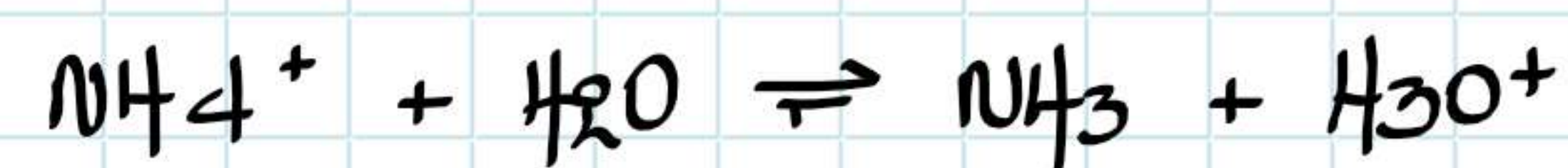
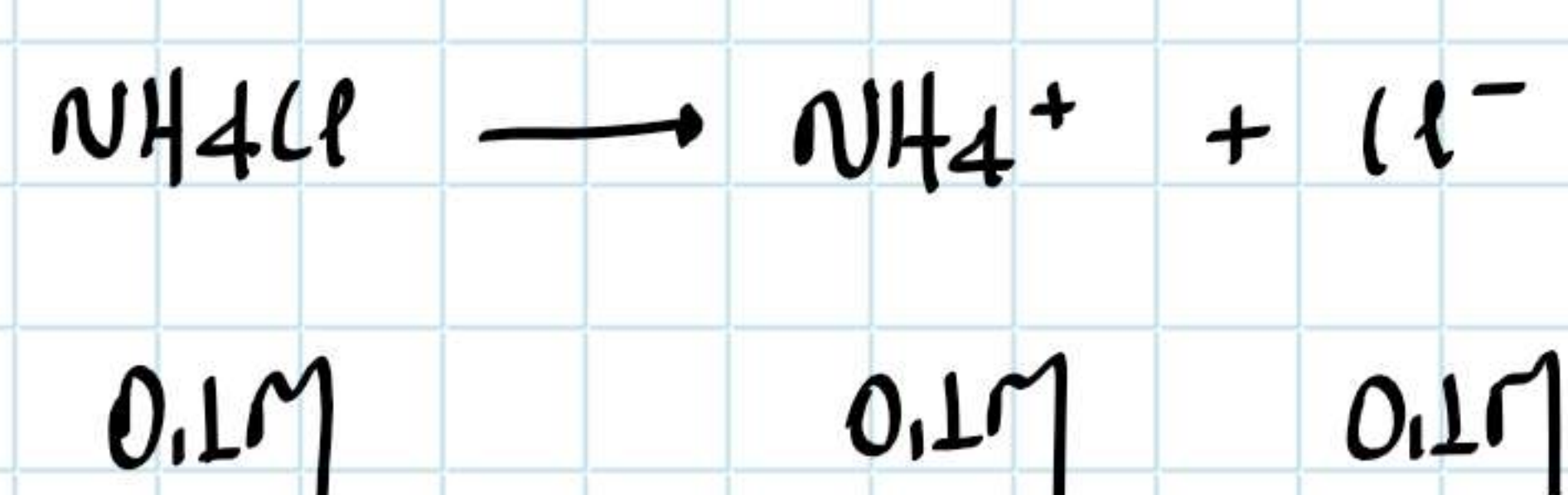
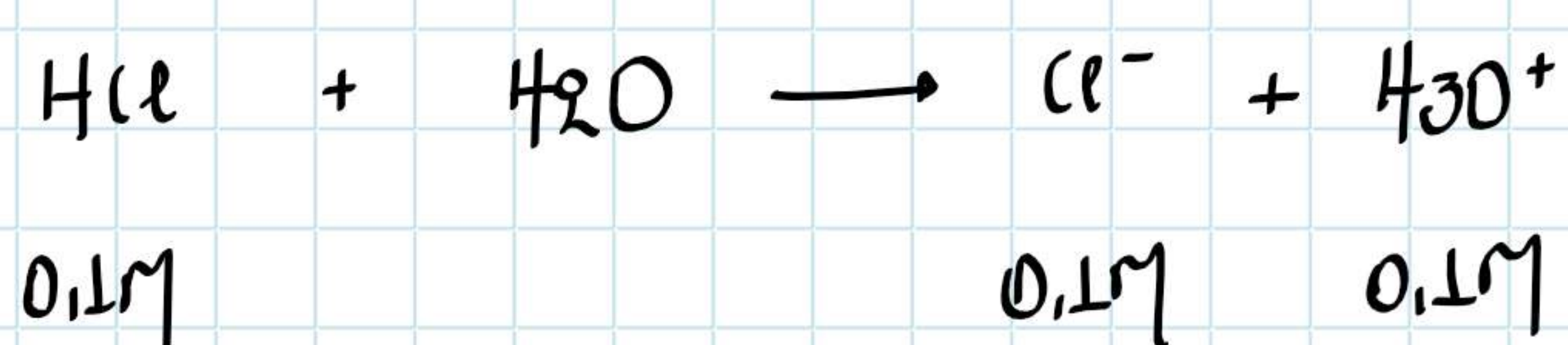
$$\Delta_1: n_{\text{NH}_4\text{Cl}} = C \cdot V = 0,1 \cdot 0,5 = 0,05 \text{ mol}$$

$$\text{HCl}: n = \frac{1,12}{22,4} = 0,05 \text{ mol}$$

Δ₂: Τα βιώματα ΔΕΝ αντιδρούν μεταξύ τους ποσοτικά.

$C_{\text{NH}_4\text{Cl}} = 0,1\text{M}$ (η συγκέντρωσή του παραμένει σταθερή)

$$C_{\text{HCl}} = \frac{0,05}{0,5} = 0,1\text{M}$$

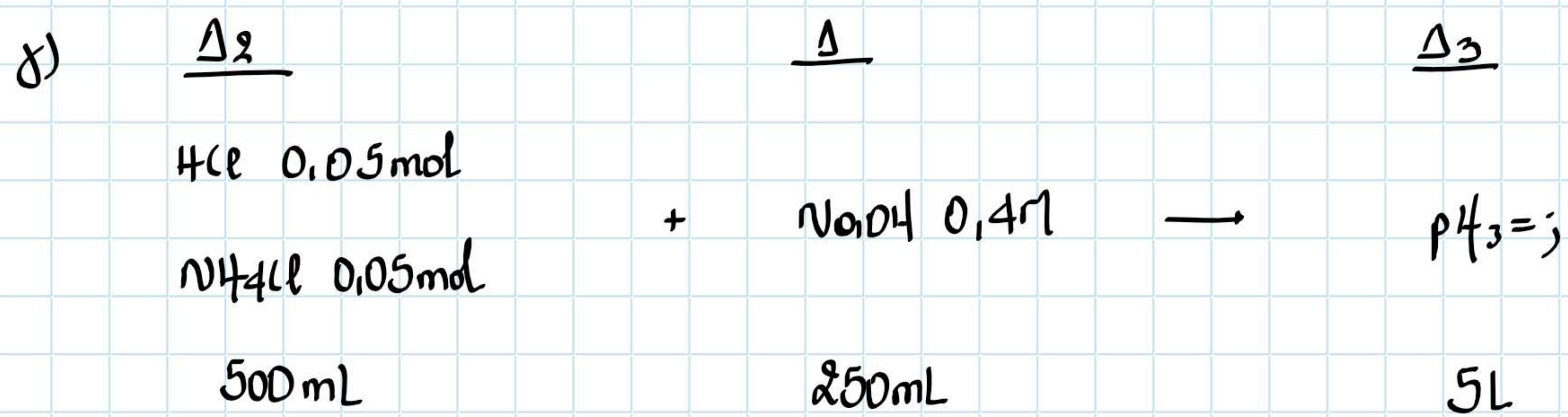


$$K_{a\text{NH}_4^+} = \frac{y \cdot (y + 0,1)}{0,1 - y} \approx \frac{y \cdot 0,1}{0,1} \Rightarrow$$

$$\Rightarrow 10^{-9} = y$$

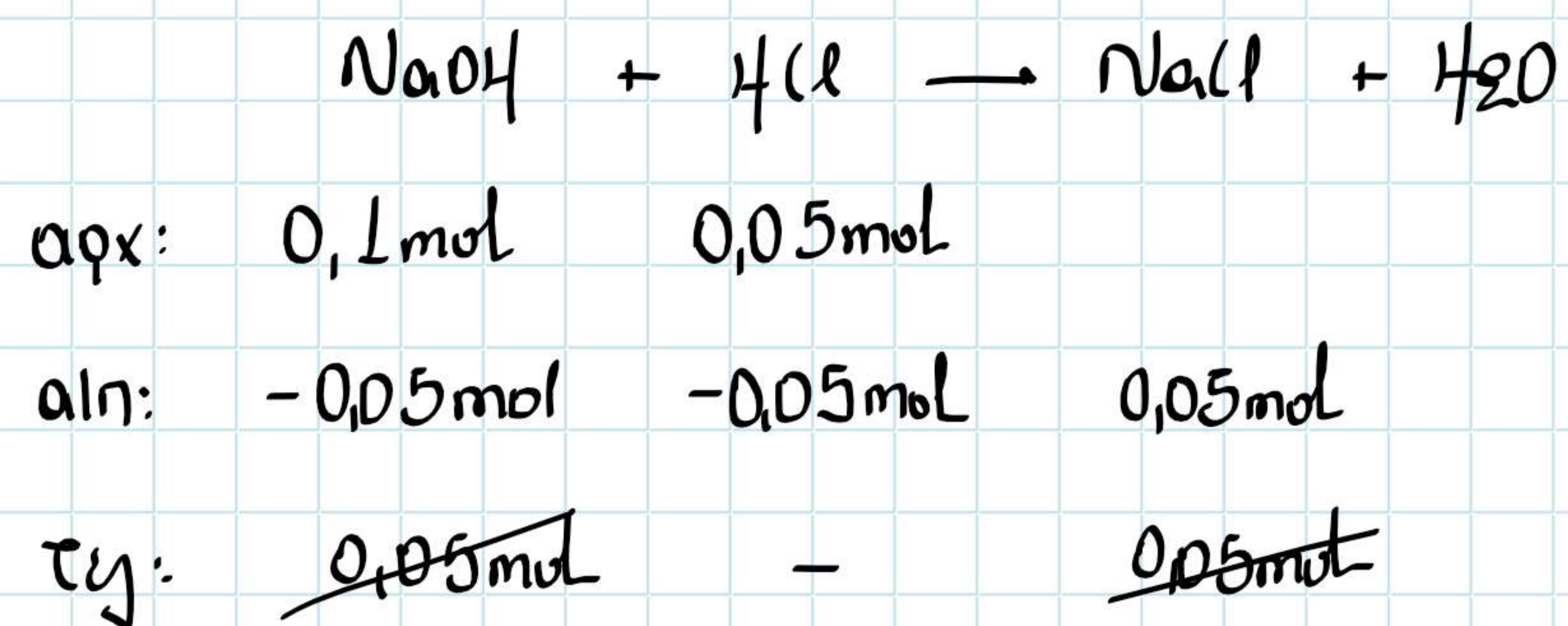
$$\text{Άρα: } [\text{H}_3\text{O}^+]_{\text{ολ}} = y + 0,1 = 10^{-9} + 0,1 \approx 0,1\text{M}$$

$$\text{pH} = \underline{\underline{L}}$$

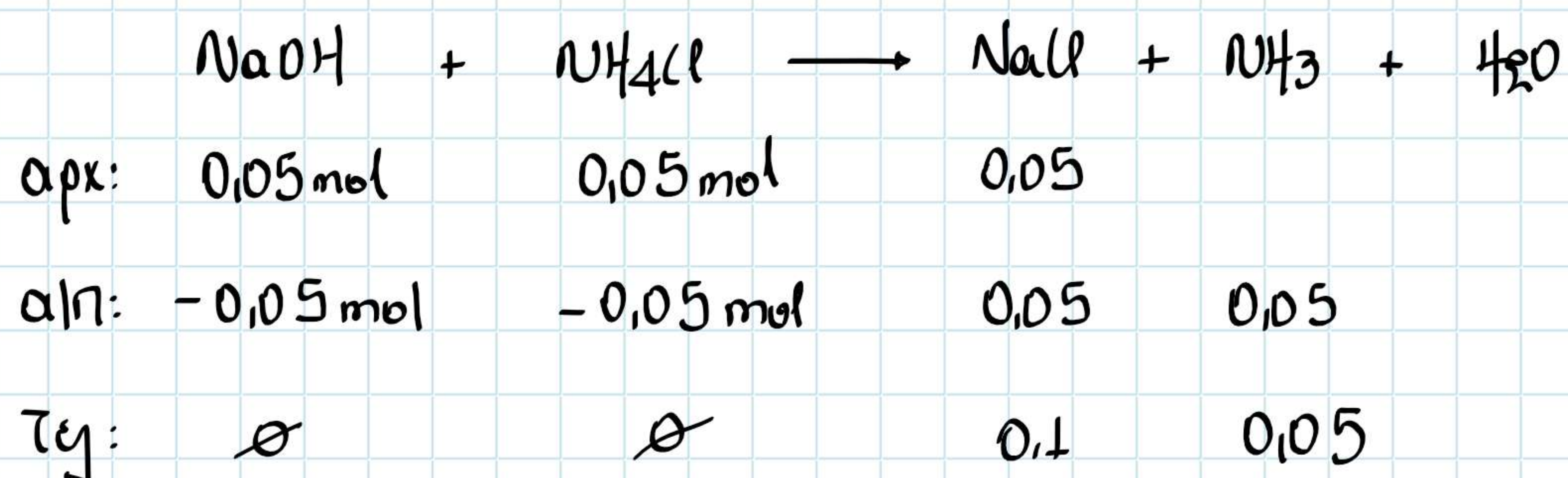


$$\underline{\Delta_2}: \quad \eta = 0,25 \cdot 0,4 = 0,1 \text{ mol}$$

Δ_3 : Το NaOH αντιδρά ποσοτικά και με το HCl και με το NH₄Cl.

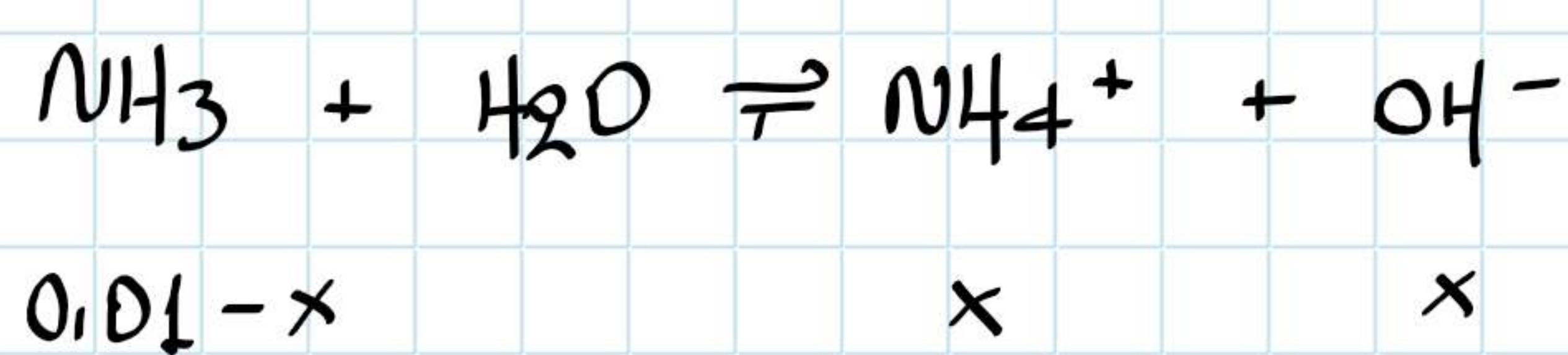
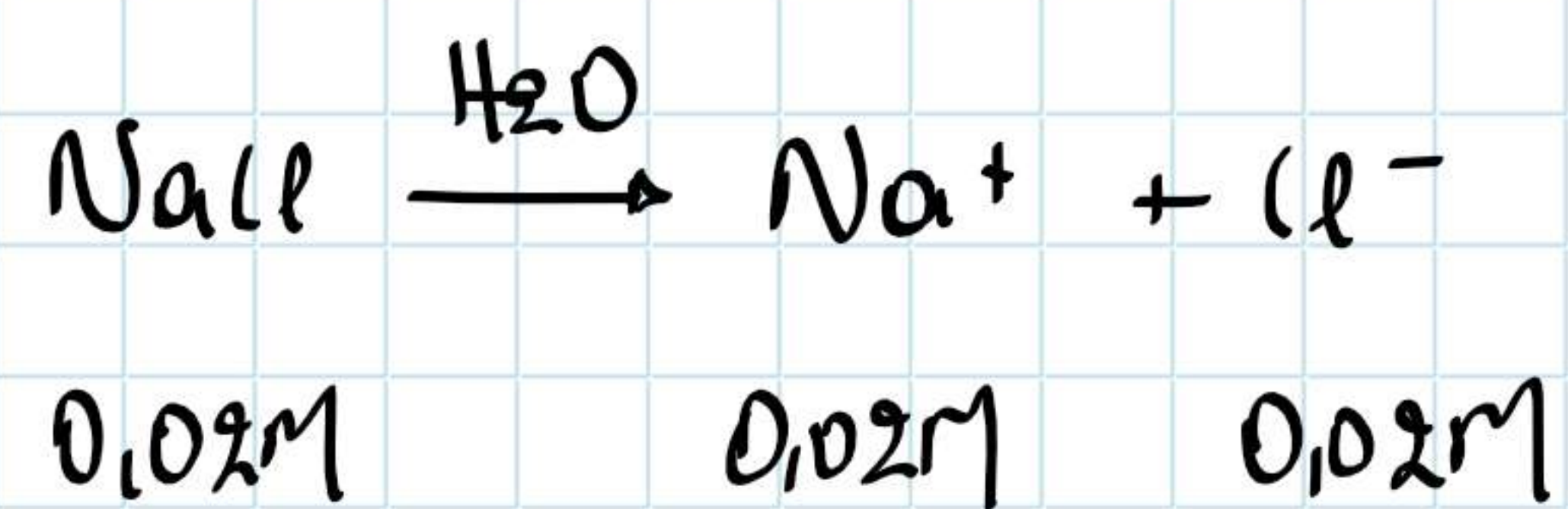


Τα 0,05 mol NaOH που ηροκίητην αντιδρουν με το NH₄Cl.



$$\text{Τελικά: } 0,1 \text{ mol NaCl} \Rightarrow C_{\text{NaCl}} = \frac{0,1}{5} = 0,02 \text{ M}$$

$$0,05 \text{ mol NH}_3 \Rightarrow C_{\text{NH}_3} = \frac{0,05}{5} = 0,01 \text{ M}$$



$$K_{\text{bNH}_3} = \frac{x^2}{0,01 - x} \approx \frac{x^2}{0,01} \Rightarrow 10^{-5} = \frac{x^2}{0,01}$$

$$\Rightarrow \underline{\underline{x = 10^{-3,5}}}$$

$$\text{pOH} = 3,5 \quad \text{και} \quad \text{pH} = 10,5 \quad \text{στους } 25^\circ\text{C}$$