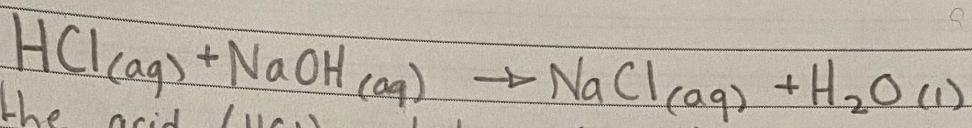


a) Which of the two trials provides the most accurate results? Explain your answer.

I believe that trial 2 provides the more accurate results because the pH balance was the neutral 7. The first trial had an end pH of 6 even if the solution was pink.

b) Write the balanced equation for the acid-base neutralization reaction between hydrochloric acid (HCl) and sodium hydroxide (NaOH). Justify your answer.



When the acid (HCl) and base (NaOH) are mixed together, the cations of the acid ( $\text{H}^+$ ) will react with the anions of the base ( $\text{OH}^-$ ) to form neutral water molecules ( $\text{H}_2\text{O}$ ). Also, the anions of the acid ( $\text{Cl}^-$ ) will react with the cations of the base ( $\text{Na}^+$ ) to form sodium chloride molecules ( $\text{NaCl}$ ).

c) Calculate the number of moles of NaOH in solution that reacted with the sample of HCl solution, given that the concentration of the NaOH solution is 0.1 mol/L. Also, express the result by using scientific notation.

$$c = \frac{n}{V}$$

$$0.1 = \frac{n}{0.0058}$$

$$0.00058 = n$$

$$\text{Number of moles} = \underline{\underline{5.8 \times 10^{-4}}}$$

d) Since you now know the number of moles of NaOH that reacted with the sample of HCl solution, what is the number of moles of HCl in solution that reacted with NaOH? Justify your answer.