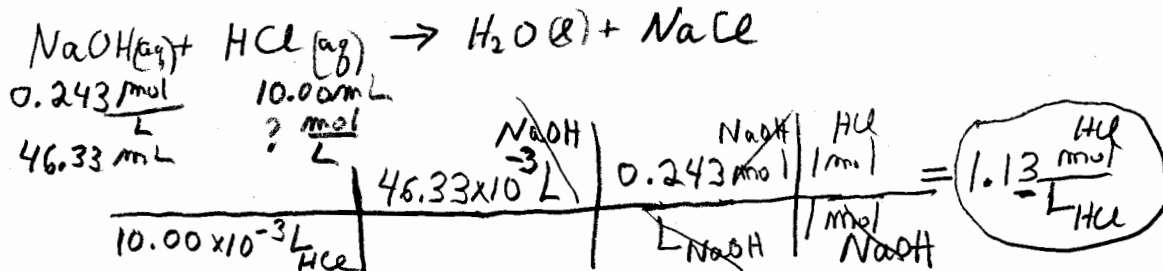


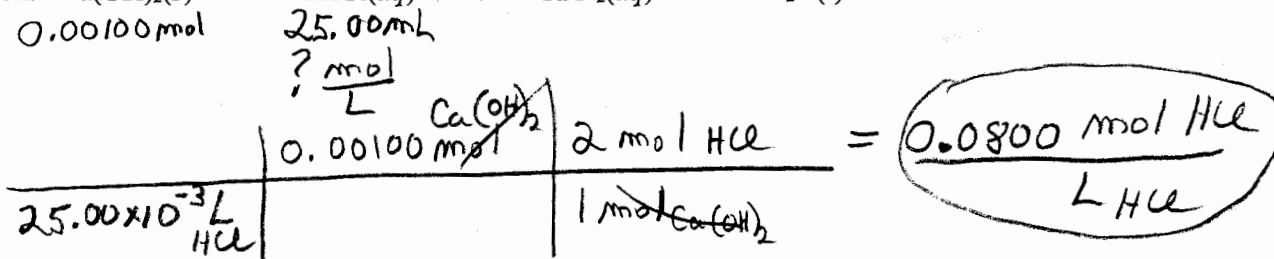
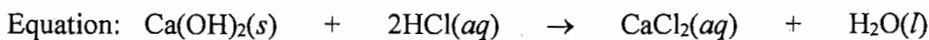
\*\*\*SHOW ALL WORK TO RECEIVE CREDIT\*\*\*

Atomic masses: K 39.10, C 12.01, O 16.00, H 1.008, Na 22.99, N 14.01, P 30.97, Cl 35.45, S 32.07.

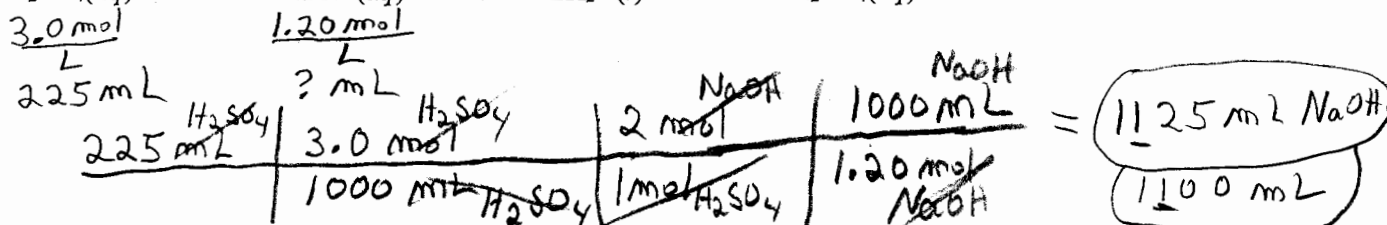
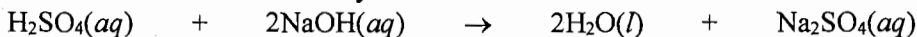
1. (5 Pts) A standard solution of 0.243 M NaOH was used to determine the concentration of a hydrochloric acid solution. If 46.33 mL of NaOH is needed to neutralize 10.00 mL of the acid, what is the molar concentration of the acid?



2. (6 Pts) A 0.00100 mol sample of Ca(OH)<sub>2</sub> requires 25.00 mL of aqueous HCl for neutralization according to the reaction below. What is the concentration of the HCl?



3. (6 Pts) Automobile batteries use 3.0 M H<sub>2</sub>SO<sub>4</sub> as an electrolyte. How many mL of 1.20 M NaOH will be needed to neutralize 225 mL of battery acid?



4. (4 Pts) What is the concentration of ammonium ions in 1.6 M ammonium phosphate, (NH<sub>4</sub>)<sub>3</sub>PO<sub>4</sub>?

3 NH<sub>4</sub><sup>+</sup> ions per formula unit so:

$$3 \times 1.6 = 4.8 \text{ M NH}_4^+$$

5. (4 Pts) What mass of K<sub>2</sub>CO<sub>3</sub> is needed to prepare 200. mL of a solution having a potassium ion concentration of 0.150 M?

