

## Answer on Question #55504 - Chemistry - General chemistry

### Question:

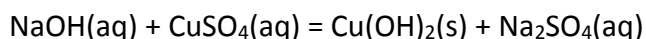
When NaOH(aq) is mixed with CuSO<sub>4</sub>(aq) a precipitate forms. Based on solubility guidelines the formula of the precipitate is \_\_\_\_\_.

Express your answer as a chemical formula. What is the identity of the precipitate that forms when 45 mL of 0.3 M HCl reacts with 40 mL of 0.35 M AgNO<sub>3</sub>? Express your answer as a chemical formula. What volume of 0.245 M H<sub>2</sub>SO<sub>4</sub> is needed to react with 55.2 mL of 0.120 M NaOH? The equation is H<sub>2</sub>SO<sub>4</sub>(aq)+2NaOH(aq)→Na<sub>2</sub>SO<sub>4</sub>(aq)+2H<sub>2</sub>O(l)

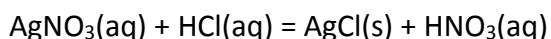
### Solution

The formula of the precipitate is **Cu(OH)<sub>2</sub>(s)**

The reaction of precipitate formation:



When 45 mL of 0.3 M HCl reacts with 40 mL of 0.35 M AgNO<sub>3</sub> the precipitate of **AgCl(s)** is forming:



For the reaction H<sub>2</sub>SO<sub>4</sub>(aq)+2NaOH(aq)→Na<sub>2</sub>SO<sub>4</sub>(aq)+2H<sub>2</sub>O(l) amount of NaOH given is

$$n(\text{NaOH}) = 0.120 \times 0.0552 = 0.006624 \text{ mol};$$

the amount of sulfuric acid required is  $n(\text{H}_2\text{SO}_4) = n(\text{NaOH})/2 = 0.003312 \text{ mol}$ . On the other hand,  $n(\text{H}_2\text{SO}_4) = c(\text{H}_2\text{SO}_4)V(\text{H}_2\text{SO}_4)$ ;

$$V(\text{H}_2\text{SO}_4) = n(\text{H}_2\text{SO}_4)/c(\text{H}_2\text{SO}_4) = 0.003312/0.245 = \mathbf{0.0135 \text{ L}}$$

**Answer: Cu(OH)<sub>2</sub>(s); AgCl(s); 0.0135 L**