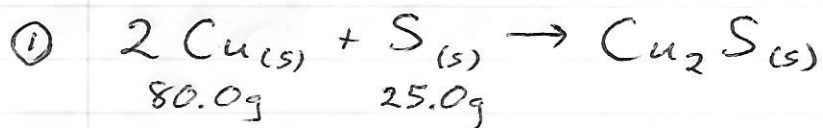


## Limiting Reagents Sample Problem



What is the limiting reagent when 80.0g of  $\text{Cu}_{(s)}$  reacts with 25.0g of  $\text{S}_{(s)}$ ?

I'm going to choose to start with Cu.



$$\textcircled{A} \quad 80.0\text{g Cu} \times \frac{1\text{ mol Cu}}{63.55\text{g Cu}} = 1.26\text{ mol Cu}$$

$$\textcircled{B} \quad 1.26\text{ mol Cu} \times \frac{1\text{ mol S}}{2\text{ mol Cu}} = 0.63\text{ mol S}$$

$$\textcircled{C} \quad 0.63\text{ mol S} \times \frac{32.06\text{g S}}{1\text{ mol S}} = 20.20\text{g S}$$

Compare the 20.20g S calculated to the 25.0g S given in the question.

-calculated amount is less than the given amount  $\Rightarrow$  S is in excess

-if S is in excess, Cu is the limiting reagent

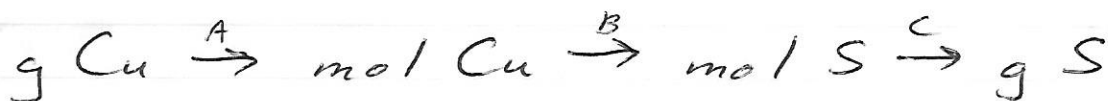
$\text{Cu}_{(s)}$  is the limiting reagent

Same reaction,  
different numbers



What is the limiting reagent when 120.0g of Cu(s) reacts with 25.0g S(s)?

Start with Cu(s)



$$\textcircled{\text{A}} \quad 120.0 \text{g Cu} \times \frac{1 \text{ mol}}{63.55 \text{g}} = 1.89 \text{ mol Cu}$$

$$\textcircled{\text{B}} \quad 1.89 \text{ mol Cu} \times \frac{1 \text{ mol S}}{2 \text{ mol Cu}} = 0.945 \text{ mol S}$$

$$\textcircled{\text{C}} \quad 0.945 \text{ mol S} \times \frac{32.06 \text{g}}{1 \text{ mol}} = 30.3 \text{g S}$$

Compare the 30.3g S calculated to the 25.0g S given in the question.

- calculated amount is greater than the given amount  $\Rightarrow$  S is the limiting reagent

- this means Cu is in excess

S(s) is the limiting reagent