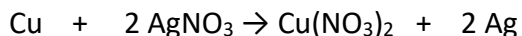


Stoichiometry Class notes

4 types of questions

1. According to the equation below, adding copper (Cu) to silver nitrate (AgNO₃) allows a chemical reaction to occur that produces silver (Ag) and copper nitrate (Cu(NO₃)₂).



a- Gram to gram question (steps 1-4)

You need 2.0 g of silver (Ag) for an experiment. What mass of the silver nitrate will you require to obtain the 2.0 g of silver that you need?

b- Gram to moles question (steps 1-3)

You need 2.0 g of silver (Ag) for an experiment. How many moles of the Cu will you require to obtain the 2.0 g of silver that you need?

c- Moles to gram question (steps 1, 3 and 4)

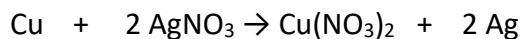
You have 1.5 moles of Cu(NO₃)₂, what mass of AgNO₃ was needed for the reaction to occur?

d- Moles to moles question (steps 1 and 3)

You have 3.0 moles of Cu(NO₃)₂, how many moles of AgNO₃ was needed for the reaction to occur?

Atoms and molecules questions – 4 types

2. According to the equation below, adding copper (Cu) to silver nitrate (AgNO₃) allows a chemical reaction to occur that produces silver (Ag) and copper nitrate (Cu(NO₃)₂).



A- Atom (or molecules) to grams (Steps 1-4)

If 3.33×10^7 atoms of Cu are available, how many grams of silver nitrate AgNO₃ would react with it?

B- Grams to atoms (or molecule) (Steps 1-4)

If 400.0 g of copper nitrate Cu(NO₃)₂ was produced, how many Cu atoms must have reacted with the copper nitrate?

C- Atoms (or molecules) to moles (Steps 1-3)

If 7.5×10^4 Ag atoms are available, how many moles of silver nitrate AgNO₃ would react with it?

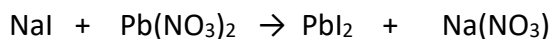
D- Moles to molecules (or atoms) (steps 1, 3 and 4)

If 3.0 moles of Cu were used in the reaction, how many molecules of Cu(NO₃)₂ would be produced?

Mole and stoichiometry combination questions

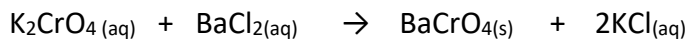
3. 'Given' not in problem, must find given to solve question

200.0 mL of NaI whose concentration is 2.0 M are reacted with $\text{Pb}(\text{NO}_3)_2$ in order to obtain the precipitate PbI_2 . Calculate the mass of PbI_2 obtained.



4. Looking for molar concentration mol/L

75mL of BaCl_2 is used to produce BaCrO_4 . If 4.81g of BaCrO_4 is made, what is the concentration of the BaCl_2 used? The following equation represents the reaction:



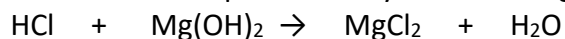
5. Looking for volume L

What volume of a 6.0M solution of HCl are needed to react with 4.85g of NaHCO_3 ? The equation that represents the reaction follows.



Practice Questions

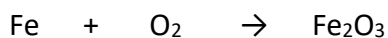
1. To neutralize hydrochloric acid (HCl), magnesium hydroxide (Mg(OH)₂), a base is added. The neutralization reaction is represented by the following equation:



a- You have 4.0 moles of HCl, what mass of Mg(OH)₂ is required to neutralize the 4.0 moles of HCl?

b- You have 4.0 moles of HCl, how many moles of H₂O is required to neutralize the 4 moles of HCl?

2. The following equation describes how iron oxide, Fe₂O₃, is produced.

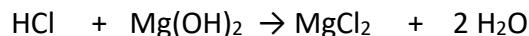


How much Fe₂O₃ is formed by the complete oxidation of 448 g of iron?

3. Using the formula $\text{CuO} + \text{NH}_3 \rightarrow \text{N}_2 + \text{Cu} + \text{H}_2\text{O}$

How many moles of ammonia (NH₃) are needed to obtain 7.00 g of copper (Cu)?

4. Use the equation below to solve questions A and B



a- If 700.0 g of water was produced, how many molecules of magnesium chloride (MgCl₂) must have reacted with the oxygen?

b- If 3.3×10^9 molecules of HCl are available, how many moles of water react with it?