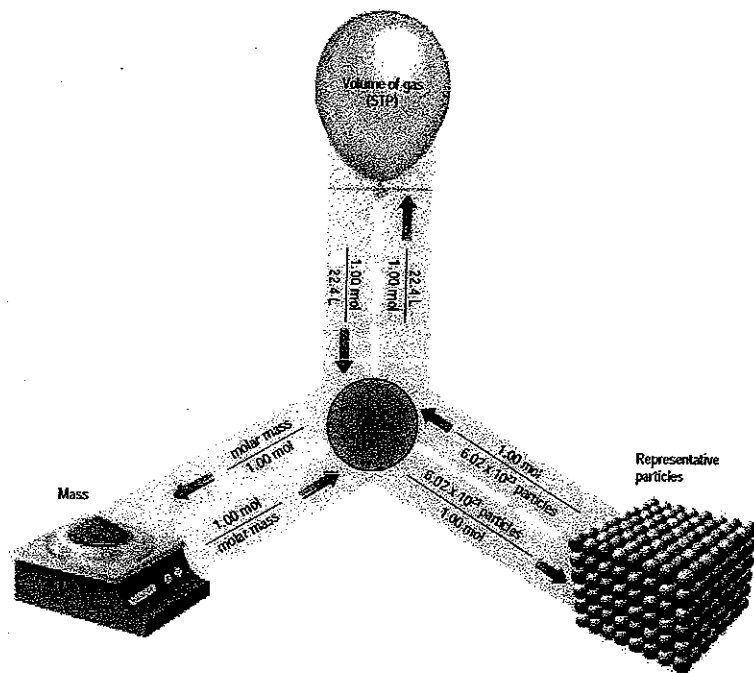


Name: _____ Hour: _____ Date: _____



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Conversion Factors:

(these factors describe what one mole of a substance can be equal to, these form the "bridges" of our dimensional analysis).

1 mole = 6.02×10^{23} atoms

1 mole = element's atomic mass in grams (calculated the same way formula mass is calculated)

1 mole = 22.4 liters of ANY gas at STP*

*STP = standard temperature and pressure

Particle Conversion: Changing between units of Moles and Atoms

1. How many Mg atoms are in 3.24 moles of Mg?

Starting amount (moles)

Conversion Factor

Ending amount (atoms)

2. 2.68×10^{24} atoms of Cu equal how many moles?

Starting amount (atoms)

Conversion Factor

Ending amount (moles)

3. How many moles are 1.505×10^{23} Na atoms?

Mass Conversions: Converting between Grams and Moles

4. Convert 5.00 moles of carbon to grams.

Starting amount (moles)

Conversion Factor

Ending amount (grams)

5. Convert 4.86×10^4 g of Mg to moles.

Starting amount (grams)

Conversion Factor

Ending amount (moles)

6. Convert 9.213 moles of Fe to grams.

Starting amount

Conversion Factor

Ending amount

Volume Conversions: Converting between Volume and Moles

7. What volume will 5 moles of O₂ gas occupy at STP?

Starting amount (moles)

Conversion Factor

Ending amount (Volume in L)

8. A container holds 7.5 liters of CO₂ at STP, how many moles of gas is this?

9. H₂ gas at STP occupies 57L of space, how many moles of H₂ are present?

Mixed Mole Problems (some may require more than one step)

10. Convert 84,520 mg of Ne to atoms.

11. How many atoms are in 45.6 grams of sulfur?

12. How many moles are in 68 grams of copper (II) hydroxide, Cu(OH)₂?

13. What is the mass of 8.944×10^{18} iron atoms in cg (remember 1g = 100 cg)?

14. How many grams are in 3.3 moles of potassium sulfide, K₂S?

Putting it Together Problems

15. What is the density of helium? (What is the mass of one mole; what is the volume of one mole?, density = Mass/Volume)

16. What is the density of Carbon di-oxide(CO₂) gas?