

10.1 The Mole: A Measurement of Matter

1. What is the mole?
2. What is Avogadro's number?
3. What kinds of things can you count using the mole?
4. What are three ways of measuring the amount of a substance?
5. Write the equation you would use to convert some number of particles to moles. (Look at page 290)
6. Look at page 290 – Table 10.1. Please copy that table onto this paper.

7. Use the above table to help you complete the chart below.

SUBSTANCE	REPRESENTATIVE PARTICLE
O	
O ₂	
H ₂ O ₂	
Na ₂ O	
O ²⁻	

8. Write the equation you would use to convert moles to particles (hint! Look at what you wrote down for number 5)
9. How many particles are in 63 moles of sulfur? Use dimensional analysis.

10. Read the Sample Problem 10.3 on page 292, explain how you convert the number of moles of a substance to the number of atoms.
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- (add more steps if needed)
11. Define molar mass.
12. How many atoms are in one mole of tungsten (W)? What is the mass of one mole of Tungsten?
13. Read page 295, and then explain how to calculate the molar mass of a compound.
14. What is the molar mass of NaOH? Of H_2SO_4 ?

True/False	The representative particle for any diatomic element, like nitrogen gas, is the atom.
True/False	There are a mole of atoms in 12 grams of carbon-12.
True/False	When converting moles to molecules you will use at least 2 conversion factors.
True/False	The unit for density is grams/ml.
True/False	The density of water is 1g/ml.

10.2 Mole-Mass and Mole-Volume Relationships

15. **In your own words**, describe how mass and moles are related.
16. Read sample problem 10.5 on page 298. Write out the equation that you would use to convert the number of moles of a substance to the mass of that substance.
17. Using dimensional analysis, answer Practice Problems 16-18 on p. 298-9.
- #16
#17

#18

18. Read page 300, the mole-volume relationship. What is Avogadro's hypothesis?
19. What does STP stand for and what are its values?
20. What is molar volume?
21. One mole of any gas = _____ liters
22. 22.4 liters of H_2 at STP is equal to how many moles of H_2 ?
23. Look at page 302 – Calculating molar mass from density. How can the density of a gas at STP and the molar volume at STP be used to calculate the molar mass of the gas?? (Write the equation!!)
24. Using Sample Problem 10.8 as a guide, solve Practice Problems #22 and #23.
#22 #23
25. Copy the Mole Road Map from page 303.

How can you use this "Road Map"?

- True/False** The values for STP are 0 degrees Celsius and 1 atm
- True/False** atm is the abbreviation for atmospheres which is a unit of pressure.
- True/False** A half of a mole of oxygen gas occupies 11.2 liters of volume at STP.
- True/False** At STP, one mole of nitrogen gas will occupy 14 liter of volume.

10.3 Percent Composition and Chemical Formulas

26. Define percent composition.
27. Percent composition is also known as _____.
28. What is the equation for calculating the percent composition of a compound?
29. What is the percent composition of H_2O ?
30. Read p.307. How can you determine the percent by mass of an element in a compound if you only know the compound's formula?

31. Do Practice Problems #34a and #35a and b.
#34a

#35a

#35b