

Mole Review

Chemistry 11 Advanced

- Calculate the number of moles in each of the following.
 - 125 mL of hydrogen gas at STP
 - 1.26×10^{24} molecules of carbon dioxide
 - 12.6 g water
 - 12.6 g sodium chloride
- Calculate the mass of each of the following.
 - 1.95×10^{22} molecules of sucrose, $C_{12}H_{22}O_{11}$
 - 2.50 L of propane, C_3H_8 , at STP
 - 0.780 mol $Ca(CN)_2$
- Determine the number of atoms in each of the following.
 - 1 molecule of $C_{17}H_{19}NO_3$
 - 2.85 mol of Ag
 - 0.875 L of carbon dioxide at STP
 - 12.9 g of $CaCO_3$
 - 12.9 g of $Fe(NO_3)_3$
- Determine the volume of the following gases at STP.
 - 12.5 g of carbon dioxide
 - 2.15 mol of propane
 - 6.88×10^{20} atoms of helium
 - 125 g of sulfur trioxide
- What volume of 0.125 M $CaCl_2$ can be made from 15.0 g?
- What is the molarity of 325 g of $NaHCO_3$ dissolved in 2500.0 mL of solution?
- What volume of 14.0 M nitric acid would be required to make 750.0 mL of 0.100 M nitric acid?
- What is the molarity of a solution that contains 36.1 g of $MgCl_2$ in 895 mL of solution.
- You need to prepare 2.50 L of a 0.125 M solution of hydrochloric acid, but the only solution available is 12.0 M. What volume of the 12.0 M solution must be diluted?
- What mass of sodium sulfate is required to prepare 750.0 mL of a 0.275 M solution?
- 225.0 mL of 0.500 M nitric acid is added to 100.0 mL of 2.00 M nitric acid. What is the molarity of the mixture?
- Two solutions are mixed together. The first solution is 250.0 mL of 0.450 M hydrochloric acid. The second solution consists of 600.0 mL of 2.800 M hydrochloric acid. What is the concentration of the solution that is obtained when the two are mixed together?
- Determine the percentage composition of each element in gallium nitrate.
- The density of a gaseous compound is 1.964 g/L at STP. Calculate the molar mass of this gas.
- Determine the empirical formula of the compound with the following percentage composition: 32.00% carbon, 42.66% oxygen, 18.67% nitrogen & 6.67% hydrogen
- Determine the empirical formula of the compound with the following percentage composition: 27.59% carbon, 1.15% hydrogen, 16.09% nitrogen & 55.17% oxygen
- An organic compound contains 37.5% carbon, 58.3% oxygen and 4.20% hydrogen. The substance has a molar mass of 192.10 g/mol. Determine the molecular formula of this compound.
- Determine the molecular formula of methyl butanoate, a compound that smells like apples. Its percent composition is 58.8% carbon, 9.8% hydrogen and 31.4% oxygen. In the gaseous state, 782 mL has a mass of 3.56 g.