

## mole conversions (Homework)

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1.

Use the average atomic masses given inside the front cover of this book to calculate the mass in grams of each of the following samples.

- (a) 0.328 mol of sodium
- (b) 4.27 mol of helium
- (c)  $5.82 \times 10^5$  mol of iron
- (d) 5.42 mol of copper
- (e)  $1.35 \times 10^{-6}$  mol of lithium
- (f) 8.13 mol of aluminum

2.

Calculate the molar mass for each of the following substances.

- (a) potassium hydrogen phosphate,  $K_2HPO_4$
- (b) barium hydride,  $BaH_2$
- (c) potassium dihydrogen phosphate,  $KH_2PO_4$
- (d) dichlorophenol,  $C_6H_4OCl_2$
- (e) ammonium sulfide,  $(NH_4)_2S$
- (f) barium perchlorate

3.

Calculate the number of molecules present in each of the following samples.

- (a) 6.73 mol of carbon monoxide
- (b) 6.29 g of carbon monoxide
- (c)  $2.71 \times 10^{-6}$  g of water
- (d)  $2.81 \times 10^{-6}$  mol of water
- (e) 5.03 g of benzene,  $C_6H_6$

4.

Calculate the number of moles of  $C_2H_5OH$  in 45.5 g of  $C_2H_5OH$ . Use a molar mass with at least as many significant figures as the data given.

5.

Calculate the mass of 0.650 moles of  $MgCO_3$ . Use a molar mass with at least as many significant figures as the data given.

6.

Calculate the number of molecules of  $CO_2$  in 72.5 g of  $CO_2$ . Use a molar mass with at least as many significant figures as the data given.

7.

Calculate the mass of  $7.75 \times 10^{23}$  molecules of  $\text{SO}_3$ . Use a molar mass with at least as many significant figures as the data given.

8.

Calculate the number of molecules of the compound and the number of atoms of each of the elements in 2.25 moles of  $\text{N}_2\text{O}_5$ .

9.

Calculate the number of formula units of the compound and the number of each ion in 8.00 moles of  $\text{Zn}(\text{NO}_3)_2$ . Enter a zero for an ion that doesn't occur in the compound.

10.

Calculate the volume of 88.0 g of  $\text{C}_4\text{H}_{10}$  gas at standard temperature and pressure (STP). Use a molar mass with at least as many significant figures as the data given.