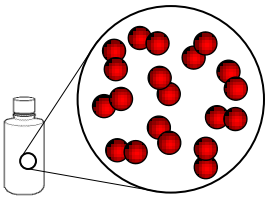
KEY

Chemistry: *Moles and Mass Relationships*

The mass of a mole of a substance expressed in grams is equal to its molecular mass.

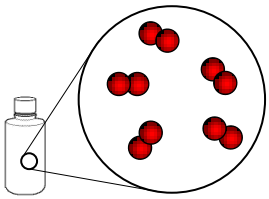
1. Each of the following bottles contains a different number of moles of oxygen gas (O_2). For jars B and C, draw molecules in the circles. The number of molecules in each circle is proportional to the number of moles of O_2 *per unit of volume*.



A
1 mol O_2

Molecular mass = 32 amu

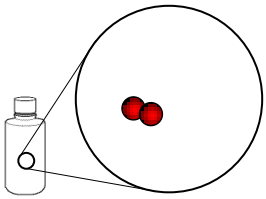
Mass = 32 g



B
0.5 mol O_2

Molecular mass = **16 amu**

Mass = **16 g**

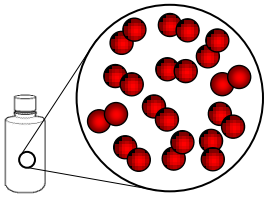


C
0.1 mol O_2

Molecular mass = **3.2 amu**

Mass = **3.2 g**

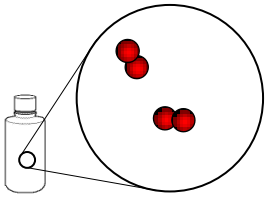
2. For jars D, E, F, use the number of molecules in the circle to determine the number of moles of O_2 in the jar. Then calculate the mass of the gas in the jar.



D

12 mol O_2

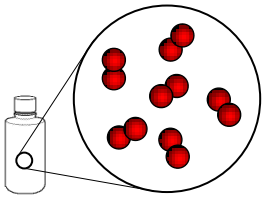
Mass = **384 g**



E

2 mol O_2

Mass = **64 g**

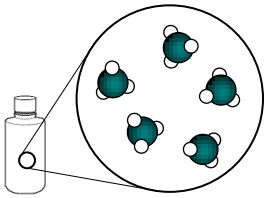


F

6 mol O_2

Mass = **192 g**

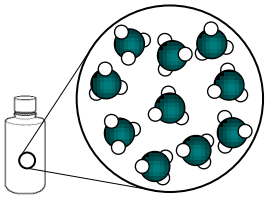
3. Jars G, H, and I contain ammonia gas (NH_3). For jars H and I, draw the molecules in the circles and calculate the mass of the gas.



G

1 mol NH_3

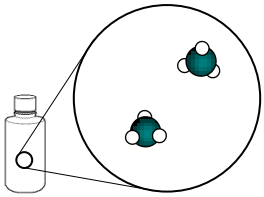
Mass = **17 g**



H

2 mol NH_3

Mass = **34 g**



I

0.4 mol NH_3

Mass = 6.8 g