Mole Conversions

Mole: the amount of a substance that contains 6.02×10^{23} respective particles of that substance

Avogadro's number: 6.02 x 10²³

Molar Mass: the mass of one mole of an element

CONVERSION FACTORS:

1 mole = 6.02×10^{23} atoms 1 mole = atomic mass (g)

Try:

1. How many atoms are in 6.5 moles of zinc?

 $6.5 \text{ moles} \qquad 6.02 \text{ x } 10^{23} \text{ atoms} = 3.9 \text{ x } 10^{24} \text{ atoms}$ 1 mole

2. How many moles of argon are in a sample containing 2.4×10^{24} atoms of argon?

3. How many moles are in 2.5g of lithium?

2.5 grams Li	1 mole	=	0.36 mol
	6.9 g		

4. Find the mass of 4.8 moles of iron.

<u>4.8 moles</u> <u>55.8 g</u> = 267.84 g = 270g 1 mole



Two Step Problems:

1. What is the mass of 2.25 x 10^{25} atoms of lead?

2. How many atoms are in 10.0g of gold?

PRACTICE PROBLEMS:

1. How many moles are equal to 625g of copper?

 $\begin{array}{c|ccc} \underline{625g \ of \ copper} & 1 \ mol \\ \hline 64 \ g \ Cu \end{array} = 9.77 \ mol \ Cu$

2. How many moles of barium are in a sample containing 4.25 x 10²⁶ atoms of barium?

 $\frac{4.25 \times 10^{26} \text{ atoms of barium}}{6.02 \times 10^{23} \text{ atoms}} = 706 \text{ mol}$

3. Convert 2.35 moles of carbon to atoms.

4. How many atoms are in 4.0g of potassium?

1 mole = 6.02×10^{23} atoms 1 mole = atomic mass (g)

5. Convert 9500g of iron to number of atoms in the sample.

6. What is the mass of 0.250 moles of aluminum?

<u>0.250 moles 27.0g</u> = 6.75 g Al 1 mole

7. How many grams is equal to 3.48×10^{22} atoms of tin?

8. What is the mass of 4.48×10^{21} atoms of magnesium?

9. How many moles is 2.50kg of lead?

 2.50kg
 1000 g
 1 mol
 =
 12.1 mol

 1 kg
 207.2 g
 =
 12.1 mol

10. Find the mass, in cg, of 3.25×10^{21} atoms of lithium.