Moles, Grams, Atoms Worksheet

1) How many moles are present in 2.45×10^{23} molecules of CH_4?

$$2.45 \times 10^{23} \text{ molecules} \times \frac{1 \text{ mol}}{6.02 \times 10^{23} \text{ molecules}} = .407 \text{ mol } CH_4$$

2) How many atoms are present in 88.1 moles of magnesium?

$$88.1 \text{ mole} \times \frac{6.02 \times 10^{23} \text{ atoms}}{1 \text{ mole}} = 5.30 \times 10^{25} \text{ atoms } Mg$$

3) How many moles are in 1.5×10^{26} atoms of lithium?

$$1.5 \times 10^{26} \text{ atoms} \times \frac{1 \text{ mole}}{6.02 \times 10^{23} \text{ atoms}} = 2.49 \times 10^{2} \text{ mole}$$

4) How many atoms are in 2.4 moles of sulfur?

$$2.4 \text{ mol} \times \frac{6.02 \times 10^{23} \text{ atoms}}{1 \text{ mole}} = 1.4 \times 10^{24} \text{ atoms } S$$

5) How many moles are in 22 grams of argon?

$$? \text{ mol} = 22 \text{ g Ar} \times \frac{1 \text{ mol}}{39.95 \text{ g Ar}} = 0.55 \text{ mol Ar}$$

6) How many grams are in 11.9 moles of chromium?

$$? \text{ g} = 11.9 \text{ mol Cr} \times \frac{51.996 \text{ g Cr}}{1 \text{ mol}} = 619 \text{ g Cr}$$

7) How many moles are in 2.3 grams of phosphorus?

$$? \text{ mol} = 2.3 \text{ g P} \times \frac{1 \text{ mol}}{30.97 \text{ g}} = 0.074 \text{ mol P}$$

8) How many grams are in 238 moles of arsenic?

$$? \text{ g} = 238 \text{ mol As} \times \frac{74.92 \text{ g}}{1 \text{ mol}} = 17,800 \text{ g As}$$

9) How many grams are there in 2.3×10^{24} atoms of silver?

$$? \text{ g} = 2.3 \times 10^{24} \text{ atoms Ag} \times \frac{1 \text{ mole}}{6.02 \times 10^{23} \text{ atoms}} \times \frac{107.87 \text{ g}}{1 \text{ mole}} = 4,100 \text{ g Ag}$$

10) How many atoms are in 9.8 grams of calcium?

$$? \text{ atoms} = 9.8 \text{ g Ca} \times \frac{1 \text{ mol}}{40.08} \times \frac{6.02 \times 10^{23}}{1 \text{ mol}} = 1.5 \times 10^{23} \text{ atoms Ca}$$

7) How many grams are there in 9.4×10^{25} molecules of H_2?

$$? \text{ g} = 9.4 \times 10^{25} \text{ molecules} \times \frac{1 \text{ mol}}{6.02 \times 10^{23} \text{ molecules}} \times \frac{2.02 \text{ g } H_2}{1 \text{ mol}} = 320 \text{ g } H_2$$