

# Mole to Mole Conversion Worksheet

Answer the following questions.

1. How many moles represent  $3.01 \times 10^{23}$  Mg atoms?
2. How many moles represent 28 grams of  $\text{CO}_2$ ?
3. How much does 5 moles of  $\text{Fe}_2\text{O}_3$  weigh?
4. How much does 23 moles of Tantalum weigh?
5. How much does 1.56 grams of aspartame ( $\text{C}_{14}\text{H}_{18}\text{N}_2\text{O}_5$ ) weigh?
6. How many moles are present in  $1.2 \times 10^{25}$  P atoms?

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## Answers

1. How many moles represent  $3.01 \times 10^{23}$  Mg atoms?

$$\text{Number of moles} = [(3.01 \times 10^{22}) / (6.023 \times 10^{23})] = 0.0499 \text{ moles}$$

2. How many moles represent 28 grams of  $\text{CO}_2$ ?

$$\text{Molar mass of } \text{CO}_2 = 44.01 \text{ g/mol}$$

$$28 \text{ grams of } \text{CO}_2 \text{ are represented by} = 28/44.01 = 0.636 \text{ moles}$$

3. How much does 5 moles of  $\text{Fe}_2\text{O}_3$  weigh?

$$\text{Molar mass of } \text{Fe}_2\text{O}_3 = 159.69 \text{ g/mol}$$

$$1 \text{ mole of } \text{Fe}_2\text{O}_3 \text{ weighs } 159.69 \text{ grams}$$

$$5 \text{ moles of } \text{Fe}_2\text{O}_3 \text{ weighs } 798.45 \text{ grams}$$

4. How much does 23 moles of Tantalum weigh?

$$\text{Molar mass of Ta} = 181 \text{ g/mol}$$

$$1 \text{ mole of Tantalum weighs } 181 \text{ grams}$$

$$23 \text{ moles of Tantalum weighs } 4163 \text{ grams} \sim 4.163 \times 10^3 \text{ grams}$$

5. How much does 1.56 grams of aspartame ( $\text{C}_{14}\text{H}_{18}\text{N}_2\text{O}_5$ ) weigh?

$$\text{Molar mass of } \text{C}_{14}\text{H}_{18}\text{N}_2\text{O}_5 = 294.3 \text{ g/mol}$$

$$1 \text{ mole of } \text{C}_{14}\text{H}_{18}\text{N}_2\text{O}_5 \text{ weighs } 294.3 \text{ grams}$$

$$\text{Number of moles} = 1.56/294.3 = 0.0053 \text{ moles}$$

6. How many moles are present in  $1.2 \times 10^{25}$  P atoms?

$$\text{Number of atoms} = (1.2 \times 10^{25}) / (6.023 \times 10^{23}) = 0.199 \times 10^2 = 19.9 \text{ moles}$$