

Name : Date :

—○ The Mole and Avogadro's Number Worksheet ○—

Answer the following questions.

1) How many moles are there in 3.01×10^{22} Mg atoms?

2) Find the number of moles in 452 g of Ar.

3) How much does 3.45 moles of CO_2 weigh?

4) How many O_2 molecules are present in 3.36 grams of oxygen?

5) How many NO_2 molecules are present in 14 grams?

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Answers

1) How many moles are there in 3.01×10^{22} Mg atoms?

6.023×10^{23} Mg atoms are present in 1 mole

3.01×10^{22} Mg atoms are present in $[(3.01 \times 10^{22}) / (6.023 \times 10^{23})] = 0.05$ moles

2) Find the number of moles in 452 g of Ar.

Molar mass of Ar = 39.948 g/mol

39.948 grams of Ar are present in 1 mole

452 grams of Ar are present in = $452 / 39.948$ moles = 11.31 moles

3) How much does 3.45 moles of CO_2 weigh?

Molar mass of CO_2 = 44.01 g/mol

1 mole of CO_2 weighs 44.01 grams

3.45 moles of CO_2 weighs 151.83 grams

4) How many O_2 molecules are present in 3.36 grams of oxygen?

Molar mass of O_2 = 31.999 g/mol

So, 31.999 grams of oxygen contain 1 mole, i.e., 6.023×10^{23} molecules

3.36 grams of oxygen contain $(3.36 / 31.999) \times 6.023 \times 10^{23} = 6.3 \times 10^{24}$ molecules

5) How many NO_2 molecules are present in 14 grams?

Molar mass of NO_2 = 46.0055 g/mol

46.0055 grams of NO_2 are represented by 1 mole

14 grams of NO_2 are represented by 0.304 moles = $0.304 \times 6.023 \times 10^{23}$ molecules =

1.83×10^{23} molecules