

MOLE CALCULATION WORKSHEET

Answer the following questions.

- 1) How many moles are in 40 grams of water?
- 2) How many atoms are in 14 moles of cadmium?
- 3) How many molecules are in 48 grams of NaOH?
- 4) How many moles are in 4.3×10^{22} molecules of H_3PO_4 ?
- 5) How many grams are in 3.7 moles of Na_2O ?
- 6) How much do 4.63×10^{24} molecules of CCl_4 weigh?

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Answers

1) How many moles are in 40 grams of water?

Molar mass of water = 18 g/mol

Number of moles = $(40/18)$ moles = 2.22 moles

2) How many atoms are in 14 moles of cadmium?

1 mole of cadmium represents 6.023×10^{23} atoms

14 moles of cadmium represents $14 \times 6.023 \times 10^{23}$ atoms = 8.4×10^{24} atoms

3) How many molecules are in 48 grams of NaOH?

Molar mass of NaOH = 39.997 g/mol

6.023×10^{23} NaOH molecules weigh 39.997 grams

So, 48 grams of NaOH consist of $6.023 \times 10^{23} \times (48/39.997) = 7.2 \times 10^{23}$ molecules

4) How many moles are in 4.3×10^{22} molecules of H_3PO_4 ?

1 mole of H_3PO_4 represents 6.023×10^{23} molecules

4.3×10^{22} molecules of H_3PO_4 consist of $[(4.3 \times 10^{22})/(6.023 \times 10^{23})] = 0.071$ moles

5) How many grams are in 3.7 moles of Na_2O ?

Molar mass of Na_2O = 62 g/mol

1 mole of Na_2O weighs 62 grams

3.7 moles of Na_2O weigh 229.4 grams

6) How much do 4.63×10^{24} molecules of CCl_4 weigh?

Molar mass of CCl_4 = 153.82 g/mol

4.63×10^{22} molecules of CCl_4 = $[(4.63 \times 10^{24})/(6.023 \times 10^{23})] \times 153.82 = 1182.44$ grams