YEAR 11 SCIENCE

The Mole Concept

Calculate moles, mass, particles and concentration (Chemistry)

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Name: _____ **Date:** _____ **Score:** _____ / 11

Formulas

$n = m \div M$ $N = n \times N_a$ ($N_a = 6.02 \times 10^{23}$ mol^{-1}) $c = n \div V$

Molar masses (g/mol): H 1.0, C 12.0, O 16.0, Na 23.0, Cl 35.5, Ca 40.1

Calculate. Show working and units.

1. Find the molar mass of H_2O.

2. Find the molar mass of $CaCO_3$.

3. How many moles are in 36.0 g of water?

4. How many moles are in 11.0 g of CO_2?

5. Find the mass of 0.500 mol of NaCl.

6. How many molecules are in 2.00 mol of water?

7. 0.200 mol of NaCl is dissolved to make 0.500 L of solution. Find the concentration.

8. What mass of NaOH (M = 40.0) is needed for 250 mL of 0.100 mol/L solution?

Choose the best answer.

9. One mole contains...

ⓐ 6.02×10^{23} particles ⓑ 1000 particles ⓒ 12 particles

10. The unit of molar mass is...

ⓐ g/L ⓑ g/mol ⓒ mol/L

11. If you double the volume of solvent, the concentration...

ⓐ stays the same ⓑ halves ⓒ doubles

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Calculate. Show working and units.

1. 18.0 g/mol
2. 100.1 g/mol
3. 2.00 mol
4. 0.250 mol
5. 29.3 g (0.500 × 58.5)
6. 1.20×10^{24} molecules
7. 0.400 mol/L
8. n = 0.0250 mol; m = 1.00 g

Choose the best answer.

9. a) 6.02×10^{23} particles
10. b) g/mol
11. b) halves

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