What is Avogadro's Number?

Worksheet

Avogadro's number is 6.022 10, the count of particles (atoms, molecules, ions) in exactly 1 mole. One mole is the SI unit for measuring amount of substance.

Questions

1. Avogadro's number equals

A) 6.022 10
B) 6.022 10
C) 6.022 10
D) 3.011 10

2. How many atoms in 2 moles of neon (Ne)?

A) 6.022 10
B) 12.044 10
C) 3.011 10
D) 1.2044 10

3. What concept does Avogadro's number bridge?

A) Pressure and volume
B) Atomic and macroscopic scales
C) Temperature and heat
D) Electrons and protons

4. 1 mole of carbon-12 has a mass of

A) 1 gram
B) 6.022 grams
C) 12 grams
D) 23 grams

5. How many atoms are in 1 mole of oxygen gas (O)?

6. What is the mass of 1 mole of carbon-12?

7. How many moles are in 18 grams of water (HO)?

8. Define: What is Avogadro's number?

9. Define: Why is Avogadro's number important?

10. Define: What is a mole?

Answer Key

1. A) 6.022 10 - Avogadro's number is exactly 6.022 10 particles per mole.

2. B) 12.044 10 - 2 moles 6.022 10 = 12.044 10 atoms (Ne is monatomic).

3. B) Atomic and macroscopic scales - It connects individual atoms (atomic scale) to measurable amounts (laboratory scale).

4. C) 12 grams - By definition, 1 mole of C = exactly 12 g. This is the basis of atomic mass units.

5. 1 mole of O contains 6.022 10 molecules. Each O molecule has 2 atoms. Total atoms = 6.022 10 2 = 12.044 10 atoms

6. By definition, 1 mole of C = 12 g (exactly). This is why Avogadro's number = 6.022 10. Any element's molar mass (in g/mol) = its atomic mass (in amu).

7. Molar mass of HO = 2(1) + 16 = 18 g/mol. Moles = mass / molar mass = 18 / 18 = 1 mole. This contains 6.022 10 water molecules.

8. 6.022 10 - the number of particles in 1 mole of any substance.

9. It connects the atomic scale to the laboratory scale - from individual atoms to grams.

10. The SI unit of amount of substance, defined as 6.022 10 particles.