

AP Chemistry

Name: _____ Score: _____

1. How many moles are in 44 g of CO_2 (molar mass 44 g/mol)?
_____ mol
2. An element is 60% of mass 10 and 40% of mass 11. Its average atomic mass (in u)?
_____ u
3. In water (H_2O , molar mass 18), what percent of the mass is oxygen (16)? (to nearest whole %)
_____ %
4. A 200 g solution is 15% sugar by mass. The mass of sugar (in g)?
_____ g
5. What is the electron configuration of oxygen (8 electrons)?
 - ☐ $1s^2 2s^2 2p^4$
 - ☐ $1s^2 2s^2 2p^6$
 - ☐ $1s^2 2s^4 2p^2$
6. In a PES spectrum, the height of a peak is proportional to...
 - ☐ the number of electrons in that subshell
 - ☐ the mass of the atom
 - ☐ the temperature
7. Across a period from left to right, the atomic radius...
 - ☐ decreases
 - ☐ increases
 - ☐ stays the same
8. Valence electrons are the electrons in the...
 - ☐ outermost shell
 - ☐ innermost shell
 - ☐ nucleus
9. One mole of any substance contains how many particles?
 - ☐ 6.022×10^{23}
 - ☐ 1000

☐ 6.022×10^{-23}

10. A mixture can have different proportions from one sample to another.

☐ True ☐ False

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1. **1 mol**

$$n = m/M = 44/44 = 1 \text{ mol.}$$

2. **10.4 u**

$$0.60(10) + 0.40(11) = 6.0 + 4.4 = 10.4 \text{ u.}$$

3. **89 %**

$$16/18 \times 100 \approx 89\%.$$

4. **30 g**

$$0.15 \times 200 = 30 \text{ g.}$$

5. **$1s^2 2s^2 2p^4$**

$2 + 2 + 4 = 8$ electrons, filling 1s, 2s, then 2p.

6. **the number of electrons in that subshell**

More electrons in a subshell means a taller peak.

7. **decreases**

More protons pull the same shell in tighter, shrinking the atom.

8. **outermost shell**

Valence electrons are the outermost ones and drive bonding.

9. **6.022×10^{23}**

A mole is Avogadro's number of particles, 6.022×10^{23} .

10. **True**

Mixtures have variable composition, unlike pure compounds.