

# 5 steps to a 5 500 ap chemistry questions to know by test day 5 steps to a 5

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### 5 Steps to a 5: 500 AP Chemistry Questions to Know by Test Day

#### Step 1: Master the Fundamentals

- **Question:** What is the difference between molarity and molality?
- **Answer:** Molarity expresses the concentration of a solute in moles per liter of solution, while molality expresses it in moles per kilogram of solvent.
- **Question:** How do you calculate the oxidation number of an element?
- **Answer:** By assigning oxidation numbers to each atom, using the rules for oxidation numbers and balancing the equation.

#### Step 2: Explore Thermodynamics and Kinetics

- **Question:** What is the Gibbs free energy equation?
- **Answer:**  $\Delta G = \Delta H - T\Delta S$ , where  $\Delta G$  is the change in Gibbs free energy,  $\Delta H$  is the change in enthalpy,  $T$  is the temperature in Kelvin, and  $\Delta S$  is the change in entropy.

- **Question:** What is the rate law for a second-order reaction?
- **Answer:**  $\text{Rate} = k[A]^2$ , where  $[A]$  is the concentration of the reactant, and  $k$  is the rate constant.

### Step 3: Understand Equilibrium

- **Question:** What is the equilibrium constant for a reaction?
- **Answer:** The ratio of the concentrations of products to reactants at equilibrium, raised to their respective stoichiometric coefficients.
- **Question:** How does the addition of a common ion affect a weak acid dissociation reaction?
- **Answer:** It shifts the equilibrium towards the reactants, reducing the dissociation of the weak acid.

### Step 4: Tackle Electrochemistry

- **Question:** What is the Nernst equation?
- **Answer:**  $E = E^\circ - (RT/nF)\ln(Q)$ , where  $E$  is the cell potential,  $E^\circ$  is the standard cell potential,  $R$  is the ideal gas constant,  $T$  is the temperature in Kelvin,  $n$  is the number of electrons transferred,  $F$  is the Faraday constant, and  $Q$  is the reaction quotient.
- **Question:** What is the difference between a galvanic and an electrolytic cell?

- **Answer:** A galvanic cell produces electricity by spontaneous reactions, while an electrolytic cell uses electricity to drive an otherwise nonspontaneous reaction.

## Step 5: Prepare for the AP Exam

- **Question:** What is the significance of the empirical formula?
- **Answer:** It provides the simplest whole-number ratio of elements in a compound.
- **Question:** How do you determine the hybridization of an atom in a molecule?
- **Answer:** By counting the number of sigma and pi bonds around the atom and using the VSEPR theory.

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