

ACS General Chemistry Exam topics*

1. **Atomic Structure**
(modern atomic theory, nuclear chemistry, quantum mechanics, orbitals, electron configurations)
2. **Molecular Structure & Bonding**
(bond types, VSEPR theory, bond shapes, Lewis dots, bond order, molecular orbitals, isomers, crystal structures)
3. **Stoichiometry**
(elemental analysis, limiting reagent, the mole, percent yield, ideal gas law, equation balancing)
4. **States of Matter/Solutions**
(phase diagrams, types of solids, phase change reactions, vapor pressure/partial pressures, molarity/molality/normality, gas laws)
5. **Energetics**
(heat capacity, calorimetry, enthalpy, bond energies, entropy, free energy, $\Delta G = \Delta H - T\Delta S$)
6. **Dynamics**
(rate laws: zero, first, second, reaction order and initial rates, Arrhenius equation, catalysis, rate laws from data)
7. **Equilibrium**
(equilibrium constants, LeChâtelier's principle, K_a/K_b and buffers, K_{sp} and solubility, K and ΔG calculations)
8. **Electrochemistry/Redox**
(oxidation states, balancing equations, redox definitions, standard reduction potentials & galvanic cells, current calculations, Nernst)
9. **Descriptive Chemistry/Periodicity**
(periodic table, periodic trends, chemical formulae, atomic and ionic size, electronegativity, ionization energy)
10. **Laboratory Chemistry**
(titration theory, laboratory equipment usage, data analysis, qualitative chemistry, laboratory procedure and safety)

*This list of topics is not necessarily complete. This is intended solely as a study guideline. Other topics may appear on this year's exam!