

**Honors  
Chemistry  
Reviews  
For District  
Assessments**

# 1<sup>st</sup> Quarter Honors Chemistry Review

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1. Definitions: Matter, elements, compounds, homogenous vs. heterogeneous, theory vs. hypothesis, temperature vs. heat, exothermic vs. endothermic.
2. Electron configurations of elements H→Cl.
3. Periodic trends including atomic radius, electronegativity, & ionization energy, group names & properties. Groups vs. Periods.
4. Density equation.
5. Properties of solids, liquids, & gases.
6. Temperature conversions→absolute zero emphasized.
7. Structure of atom (p+, n, e-) including position, charges, masses→Know by looking at the PT # of protons, neutrons, & electrons an element has.
  - Know why nucleus has net positive charge.
8. Know ions & isotopes & how to tell if an atom is an isotope.
9. Lewis Dot Structures
10. Nonmetals vs. metals
11. Nuclear Chemistry→alpha particles.
12. Moles, molar mass conversions (grams to moles to atoms/molecules).
13. Metals, nonmetals, & metalloids→know how to visually identify from PT.
14. Know contributions of the following scientists: Milliken, Thomson, Rutherford, Einstein, Bohr
15. Energy in the form of light is related to position of electrons in their energy levels

# 1<sup>st</sup> Semester Final Review—Honors Chemistry

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1. **Definitions:** Matter, elements, compounds, homogenous vs. heterogeneous, theory vs. hypothesis, temperature vs. heat, exothermic vs. endothermic, chemical vs. physical changes, atomic number vs. atomic mass, Law of Mass Conservation
2. Electron configurations of elements H→Cl.
3. Periodic trends including atomic radius, electronegativity, & ionization energy, group names & properties. Groups vs. Periods.
4. Density equation.
5. Properties of solids, liquids, & gases.
6. Temperature conversions→absolute zero emphasized.
7. Structure of atom (p+, n, e-) including position, charges, masses→Know by looking at the PT # of protons, neutrons, & electrons an element has.
  - Know why nucleus has net positive charge & nucleus has most mass vs. entire atomic volume.
8. Know ions & isotopes & how to tell if an atom is an isotope.
9. Lewis Dot Structures
10. Nonmetals vs. metals
11. Nuclear Chemistry→alpha particles.
12. Moles, molar mass conversions (grams to moles to atoms/molecules).
13. Metals, nonmetals, & metalloids→know how to visually identify from PT.
14. Types of bonding→ionic, covalent, metallic, hydrogen, & properties of each.
15. Anions vs. cations.
16. Standard Temperature & Pressure (STP)→understand that 1 atm can be 760 torr or 760 mm Hg.

17. Dalton's Law of Partial Pressure

18. Graham's Law

19. Ideal Gas Law

20. Kinetic Theory of Gases

21. Absolute zero is NOT standard temperature? Go over the differences!

22. Balancing equations, coefficients, mole ratios & converting from grams to moles & back from moles to grams again.

23. % Composition & % Yield

24. Naming covalent molecules & binary ionic compounds.

25. Know most used polyatomic ions.

26. Types of reactions (synthesis, s. replacement, d. replacement & decomp.)

27. Reactants vs. products.

28. Biological molecules → types of bonding within biological polymers.

29. Scientific contributions: Milliken, Thomson, Rutherford, Bohr

## 3<sup>rd</sup> Quarter Honors Chemistry Review

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1. **Definitions:** elements vs. compounds, specific heat capacity, chemical vs. physical, ions vs. atoms, exothermic vs. endothermic, pressure, diffusion, joule, monatomic vs. diatomic, periodic trends.
2. Ionic vs. metallic, vs. covalent bonding.
3. Properties of ionic substances vs. covalent.
4. Lewis Dots
5. Hydrogen Bonding → How it affects water vs. other covalently bonded molecules.
6. Calculate molar masses of molecules/compounds → adding it up.
7. 4 Types of Reactions.
8. Balancing Equations.
9. Stoichiometry → mole to mole, mole to gram, gram to mole, gram to gram....
10. Calculations → ppm, g/L, molarity, specific heat, heat of fusion/vaporization.
11. Phases of matter → phase diagram interpretation, identify solids, liquids, gases.
12. Closed vs. Open systems & equilibrium (how temp, pressure & concentrations affect equilibrium shifts).
13. Kinetic Molecular Theory of gases vs. liquids & how pressure plays a role in KMT of gases.
14. Gas Laws → Combined only no  $PV=nRT$  (no standards for Ideal).
15. Catalysts & how it affects reactions.
16. van der Waals forces
17. Gibb's Free Energy / Enthalpy calculations
18. Colligative properties
19. separation of mixtures using chromatography & distillation
20. Acid Base Definitions & pH calculations using concentration

21. Buffers

22. Role of Activation Energy

# Chemistry Honors 2<sup>nd</sup> Semester Final Review

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1. **Definitions:** elements vs. compounds, specific heat capacity, chemical vs. physical, ions vs. atoms, exothermic vs. endothermic, pressure, diffusion, joule, monatomic vs. diatomic.
2. Ionic vs. metallic, vs. covalent bonding.
3. Properties of ionic substances vs. covalent.
4. Lewis Dots
5. Hydrogen Bonding → How it affects water vs. other covalently bonded molecules.
6. Calculate molar masses & number of atoms in molecules/compounds → adding it up.
7. 4 Types of Reactions.
8. Balancing Equations.
9. Stoichiometry → mole to mole, mole to gram, gram to mole, gram to gram....
10. Calculations → ppm, g/L, molarity, specific heat, heat of fusion/vaporization.
11. Phases of matter → phase diagram interpretation, identify solids, liquids, gases.
12. Closed vs. Open systems & equilibrium (how temp, pressure & concentrations affect equilibrium shifts).
13. Kinetic Molecular Theory of gases vs. liquids & how pressure plays a role in KMT of gases.
14. Gas Laws → Combined only no  $PV=nRT$  (no standards for Ideal).
15. Catalysts & how it affects reactions (know visually).
16. Biological Polymers vs. monomers → proteins & carbs & type of bonding within them.
17. Acids/Bases → Properties of both including strong vs. weak, electrolyte vs. non, pH scale, hydronium ions.
18. Reaction Rates as a function of particle collisions, visually understand endo vs. exothermic reactions, increased reactants, temp & pressure (how they affect overall reaction rate).
19. Nuclear Chemistry → types/penetration & properties of radiation (alpha, beta, gamma), fission vs. fusion, Einstein's equation of energy & mass, isotopes; Calculate half lives
20. Organic Chemistry → types of bonds within organic molecules, alkanes, visual naming, 4 basic organic molecules (proteins, carbs, nucleic acids, lipids), polymers vs. monomers.
21. Writing & calculating equilibrium constants.
22. Identify and balance redox reactions.
23. Naming & identifying organic molecules including benzene; functional groups; R-group structure of amino acids; polymerization reactions