

100 things you need to know to take the Chemistry Regents

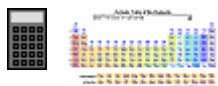
Looking at past Regents exams, these skills come up most regularly.

On the exam you must be able to...	
1	Matter & Energy <ol style="list-style-type: none">1. recognize and use properties of elements, compounds, and mixtures.2. use Kelvin and Celsius temperature scales, conversions, and fixed points.3. calculate calories.4. interpret phase change diagrams & related energy changes.5. solve Boyle's Law problems.6. solve Charles's law problems.7. apply Avogadro's Hypothesis.8. distinguish between vapor pressure of a liquid and its boiling point.9. recognize examples of sublimation.
2	Atomic Structure <ol style="list-style-type: none">1. understand the relationship between number of protons, neutrons, and electrons in atoms and ions.2. define and recognize isotopes.3. understand ground and excited state atoms, meaning of spectral lines.4. know the relation of principal quantum number (n), number of sublevels, and number of electrons.5. utilize the numbers of electrons, and their configurations in atoms and ions.6. interpret and create electron dot symbols.7. understand alpha and beta decay; equations and changes in the nucleus.8. do and interpret Half-life calculations.
3	Bonding <ol style="list-style-type: none">1. identify water molecules as looking like Mickey Mouse.2. relate the role of charges to all types of bonds.3. apply properties and characteristics of ionic bonding.4. apply properties and characteristics of covalent bonding.5. identify bond types by using electronegativity values.6. recognize examples of coordinate covalent bonding.7. recognize examples of Van der Waals forces.8. write formulas ,including the Stock system.9. decode and encode proper nomenclature.
4	The Periodic Table <ol style="list-style-type: none">1. use the properties of periods of the periodic table.2. know the Atom and ion size trends.3. utilize it for electron configuration of atoms and ions.4. name alkali, alkaline, halogen, and noble gas families; identify members.5. know the properties of families (groups) on the periodic table.6. understand ionization energy, trends on periodic table.7. identify transition elements and know properties.

5	<p>The Mathematics of Chemistry</p> <ol style="list-style-type: none"> balance and use mole ratios in equations. solve percent composition problems. calculate empirical formulas and relate to true formulas. use equations to determine relations between moles, grams, volume of a gas, and number of particles. describe results of Colligative properties. determine the number of particles from a given formula. use Table G to predict stability of a compound. use Table G to predict spontaneous reactions. utilize the relation between density and volume of a gas at STP.
6	<p>Kinetics & Equilibrium</p> <ol style="list-style-type: none"> write heat of reaction (ΔH) from equations. interpret potential energy changes in a chemical reaction. use Le Chatelier's principle to predict changes in equilibrium reactions. predict the effect of a catalyst on reaction rates and equilibrium systems. write and interpret equilibrium constant expressions. write and interpret solubility product constant expressions. recognize entropy (randomness) factors in equations. use the table of solubilities. identify Free energy changes (Gibbs Equation). identify spontaneous reactions from Table N.
7	<p>Acid-Base Theories</p> <ol style="list-style-type: none"> apply the properties of acids and bases. calculate neutralization concentrations. identify Bronsted acids and bases or conjugate pairs. calculate and interpret pH values. Identify amphiprotic substances. use Table L to identify strength of acids and bases.
8	<p>REDOX & Electrochemistry</p> <ol style="list-style-type: none"> calculate oxidation numbers. identify oxidation or reduction half reactions. identify oxidizing agents and substances oxidized in an equation. identify reducing agents and substances reduced in an equation. identify REDOX reactions. balance a REDOX reaction.
9	<p>Organic Chemistry</p> <ol style="list-style-type: none"> identify isomers. use general formulas or structural formulas to identify alkanes, alkenes, alkynes, and members of the benzene series. name a compound from its structural formula.

9	<ol style="list-style-type: none"> name a compound from its structural formula. identify primary, secondary, and tertiary alcohols. identify mono-, di-, and trihydroxy alcohols. identify ketones, acids, aldehydes, esters, and ethers. recognize addition, substitution, fermentation, polymerization, and esterification reactions.
10	<p>Applications of Chemical Principles</p> <ol style="list-style-type: none"> know the steps of the Haber and Contact processes. know the principles of reducing ores to their metals. utilize the principles of corrosion. know the electrodes of the Ni-Cad and lead acid batteries. describe the "cracking" and polymerization process of distillation.
11	<p>Nuclear Chemistry</p> <ol style="list-style-type: none"> identify fissionable elements utilize nuclear equations. identify the roles of examples of substances that are fuels, moderators, coolants, control rods, and shielding in a nuclear reactor. recognize uses of radioisotopes.
12	<p>Laboratory Activities</p> <ol style="list-style-type: none"> read a scale from the drawing of an instrument. use significant figures in operations. calculate the percent of water in a crystal. calculate percent error in an experiment.

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