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| AICE Chemistry 2 | | **Standards-Based Education Priority Standards** |
| **12th Grade** | | |
| *Physical Chemistry - Solutions and Reaction Rates* | | |
| PS1 | Solve problems accurately with atoms, moles, reactions, titrations, and stoichiometry | |
| PS2 | Calculate the pH and [H+] for strong and weak acids, strong bases, and buffer solutions | |
| PS3 | Use and calculate solubility product to solve problems, including the common ion effect | |
| PS4 | Outline the different characteristics & modes of action of catalysts | |
| *Physical Chemistry – Energy and Electricity* | | |
| PS5 | Solve problems related to electrolysis | |
| PS6 | Solve problems related to standard electrode and cell potentials and use those to predict the feasibility of a reaction. | |
| PS7 | State the possible advantages of using other types of fuel cells | |
| PS8 | Apply Hess’ Law to construct simple energy cycles (including Born-Haber cycles and lattice energy) | |
| PS9 | Define entropy; explain, predict, and calculate entropy changes in reactions | |
| PS10 | Define Gibb’s free energy; calculate G for a reaction, state whether a reaction will be feasible using G values and temperature | |
| *Inorganic Chemistry* | | |
| PS11 | Use and apply knowledge of the physical, chemical, and isometric properties of the first row of transition elements, including explaining the origin of color in transition elements. | |
| PS12 | Deduce and use expressions for the stability constant (Kstab) of a ligand exchange and explain ligand exchange in terms of Kstab and color change of transition elements. | |
| PS13 | Interpret & explain the trend in the thermal stability of nitrates & carbonates & the variation of solubility of the hydroxides & sulfates | |
| PS14 | Construct and use rate equations, including the rate constant, half lives, and multi-step reactions and explain how external factors can affect the rate of a reaction. | |
| *Organic Chemistry* | | |
| PS15 | Interpret and use the general, structural, displayed, and skeletal formula, nomenclature, and bonding of organic compounds | |
| PS16 | Describe the chemistry of arenes including mechanism of substitution and electron delocalization; predict reactions using differences in reactivity | |
| PS17 | Use and apply the chemistry of phenol in reactions and in the relative acidities of compounds | |
| PS18 | Describe and explain the reactions of, acidity of, and oxidation of carboxylic acids | |
| PS19 | Describe and explain the reactions of and hydrolysis of acyl chlorides | |
| PS20 | Describe and explain formation, properties, and reactions of primary amines | |
| PS21 | Describe and explain formation, properties, and reactions of amides | |
| PS22 | Describe and explain formation, properties, and reactions of amino acids | |
| *Applications of Chemistry* | | |
| PS23 | Describe and apply the process of electrophoresis including the effect of pH and the partition coefficient | |
| PS24 | Describe, predict and apply multiple types of polymerization reactions | |
| PS25 | Describe and apply the properties of polymers, including degradable polymers | |
| PS26 | Use and apply knowledge of chromatography analytical techniques | |
| PS27 | Use and apply knowledge of mass spectrometry analytical techniques | |
| PS28 | Use and apply knowledge of NMR analytical techniques | |
| PS29 | For a complex organic molecule, describe, devise and analyze multi-stage synthetic routes | |
| *Literacy in Science* | | |
| PS30 | Determine the central ideas or conclusions of a text | |
| PS31 | Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text. | |
| PS32 | Write arguments focused on discipline-specific content | |
| PS33 | Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience | |
| PS34 | Plan and execute an experiment appropriately and accurately | |
| PS35 | Analyze an experiment or investigation | |
| PS36 | Students will develop and utilize appropriate organizational tools to ensure academic success | |