Unit I Learning Log: Reaction Kinetics

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| **Learning Intentions** | **Practice** | **Evidence** | **Test Review** |
| A1: demonstrate awareness that reactions occur at differing rates* Give examples of reactions proceeding at different rates
* Recognize that rate is described in terms of some quantity per unit of time

A2: experimentally determine rate of a reaction* Identify properties that could be monitored in order to determine a reaction rate
* Recognize some of the factors that control reaction rates
* Compare and contrast factors affecting the rates of both homogeneous and heterogeneous reactions
* Describe situations in which the rate of reaction must be controlled
* Calculate the rate of a reaction using experimental data
 | I.1 #1 – 6I.2 #7 – 9, I.3 #10 – 17I.4 #18 – 19Problem Set #2 | Quiz #1Lab 18B |  Multiple Choice: 9, 10, 12, 14, 15, 20, 23, 24, 27, 33, 34, 38, 43, 48, 49, 55, 56 Written: 4, 7, 11, 14, 17, 18 |
| A3: demonstrate knowledge of collision theory* Identify the following principles as aspects of collision theory: reactions are the result of collisions between reactant particles; not all collisions are successful; sufficient KE and favourable geometry are required; to increase the rate of a reaction, one must increase the frequency of successful collisions; energy changes are involved in reactions as bonds are broken and formed; a KE distribution curve can explain how changing temperature or adding a catalyst changes the rate

A5: apply collision theory to explain how reaction rates can be changed* Use collision theory to explain the effect of the following factors on reaction rate: nature of reactants, concentration, temperature, surface area
 | I.5 #20 – 22Problem Set #3 | Quiz #1 | Multiple Choice: 22, 25, 28, 29, 31, 35, 39, 40, 44, 50, 51, 52, 57 Written: 2, 3, 12, 15, 16, 19 |
| A4: describe the energies associated with reactants becoming products* Describe the activated complex in terms of its potential energy, stability, and structure
* Define activation energy
* Correctly describe the relationship between activation energy and rate of reaction
* Describe the changes in PE and KE as reactant molecules approach each other
* Draw and label PE diagrams including H, activation energy, and the energy of the activated complex
* Relate the sign of H to whether the reaction is exothermic or endothermic
* Write chemical equations that describe energy effects as a chemical equation that includes the energy term and a chemical equation using H notation
 | I.6 #23 – 28I.7 #29 – 32I.8 #33 – 45Problem Set #4 | Quiz #2 | Multiple Choice: 1, 2, 3, 4, 5, 13, 19, 21, 26, 30, 32, 36, 41, 45, 58, 59 Written: 9, 10, 13, 20 |
| A6: analyse the reaction mechanism for a reacting system* Explain why most reactions involve more than one step
* Describe a reaction mechanism as the series of steps the result in the overall reaction and describe the role of the rate-determining step
* Explain the significance and role of a catalyst
* Identify reactant, product, reaction intermediate, activated complex, and catalyst from a given reaction mechanism
 | I.9 #46 – 53I.10 # 54 – 55 | Quiz #2 | Multiple Choice: 11, 37, 42, 46, 60 Written: 1, 5, 6, 8 |
| A7: represent graphically the energy changes associated with catalyzed and uncatalyzed reactions* Compare the PE diagrams for a catalyzed and uncatalyzed reaction in terms of: reactants, products, activated complex, reaction intermediates, reaction mechanism, H, activation energy
 | I.11 + I.12 #56 – 61 |  | Multiple Choice: 16, 17, 18, 47, 53, 54 Written:  |
| A8: describe the uses of specific catalysts in a variety of catalysts* Identify platinum in automobile catalytic converters as a catalyst
 | I.13 #62 – 63 |  | Multiple Choice: Written: |