C6 Rate & Extent of Chemical Change

Can you…?	☺	😐	☹
6.1.1 Calculating rates of reactions			
State how the rate of a chemical reaction can be measured.			
Calculate mean rate of reaction using the quantity of reactant used or product formed.			
State the units of rate of reaction.			
Draw graphs showing the quantity of product formed or reactant used up against time.			
Interpret these graphs and describe the changing rate of reaction.			
Draw tangents to curves on these graphs and use the slope as a measure of the rate of reaction.			
Calculate the gradient of a tangent to determine the rate of reaction at a specific time.			
6.1.2 Factors which affect the rates of chemical reactions			
State the factors which affect the rate of reaction.			
Describe how changing each factor affects the rate of reaction.			
6.1.3 Collision theory and activation energy			
State the definition of activation energy.			
Predict and explain the effect of changing factors on reaction rate using collision theory.			
Predict and explain the effects of changes in the size of pieces of a reacting solid on reaction rate in terms of surface area to volume ratio.			
Use simple ideas about proportionality when using collision theory to explain the effect of a factor on the rate of a reaction.			
6.1.4 Catalysts			
State what a catalyst is and what it does.			
Draw a reaction profile for a reaction with a catalyst and without a catalyst.			
Identify catalysts in reactions from their effect on the rate of reaction and because they are not included in the chemical equation for the reaction.			
Explain catalytic action in terms of activation energy.			
6.2.1 Reversible reactions			
State what a reversible reaction is.			
Recall that the direction of reversible reactions can be changed by changing the conditions. For example: ammonium chloride $\underset{\text{cool}}{\overset{\text{heat}}{\rightleftharpoons}}$ ammonia + hydrogen chloride			

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6.2.2 Energy changes and reversible reactions			
Recall that If a reversible reaction is exothermic in one direction, it is endothermic in the opposite direction. The same amount of energy is transferred in each case. For example: hydrated copper sulfate (blue) ⇌ (endothermic / exothermic) anhydrous copper sulfate (white) + water			
6.2.3 Equilibrium			
Explain what is meant by equilibrium.			
6.2.4 The effect of changing conditions on equilibrium (HT only)			
Recall that the relative amounts of all the reactants and products at equilibrium depend on the conditions of the reaction.			
Recall that if a system is at equilibrium and a change is made to any of the conditions, then the system responds to counteract the change.			
Recall that the effects of changing conditions on a system at equilibrium can be predicted using Le Chatelier's Principle.			
Make qualitative predictions about the effect of changes on systems at equilibrium when given appropriate information.			
6.2.5 The effect of changing concentration (HT only)			
Recall that if the concentration of one of the reactants or products is changed, the system is no longer at equilibrium and the concentrations of all the substances will change until equilibrium is reached again.			
Describe the effect of changing concentrations of products or reactants on a system in equilibrium.			
Interpret appropriate given data to predict the effect of a change in concentration of a reactant or product on given reactions at equilibrium.			
6.2.6 The effect of temperature changes on equilibrium (HT only)			
Describe the effect of increasing the temperature on a system in equilibrium.			
Describe the effect of decreasing the temperature on a system in equilibrium.			
Interpret appropriate given data to predict the effect of a change in temperature on given reactions at equilibrium.			
6.2.6 The effect of temperature changes on equilibrium (HT only)			
Describe the effect of increasing the pressure on a system in equilibrium.			
Describe the effect of increasing the pressure on a system in equilibrium.			
Interpret appropriate given data to predict the effect of pressure changes on given reactions at equilibrium.			

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