

Year 12 Chemistry Revision Tables

Using and Controlling Reactions

Topic 3.1: Measuring Energy Changes

Expectation From SACE Subject Outline <i>Note: these can be asked in converse</i>	Summary of things I know about this (include tricks for memorising things, etc.)	Example question(s) to practice until I can do under test conditions without help There are likely to be some in the textbook too; also take note of questions you'd like examples of from the teacher
Identify combustion and respiration as reactions that release energy and photosynthesis as a reaction that absorbs energy.		Assignment 1 Q1 Test 1 Q1
Deduce whether a reaction is exothermic or endothermic from information provided.		Assignment 1 Q3 Test 1 Q2(a)
Calculate the heat released or absorbed for a reaction from experimental data, given the specific heat capacity of water ($4.18\text{Jg}^{-1}\text{K}^{-1}$).		Assignment 1 Q4(a), Q6(b)(ii) Assignment 2 Q6, Q7
Determine enthalpy changes from experimental data for reactions, including: <ul style="list-style-type: none"> · the combustion of alcohols · the neutralisation of acids with bases · solution processes. 		Assignment 1 Q4(b), Q6(b)(iii) Test 1 Q2(b)(i)
Identify a reaction as exothermic or endothermic, given a thermochemical equation or the value of its enthalpy change.		Assignment 1 Q3
Write thermochemical equations that correspond to given molar enthalpies of combustion, neutralisation, and solution.		Assignment 1 Q2, Q6(a) Assignment 2 Q4 Test 1 Q2(b)(ii) Test 1 Q3(a)(v)
Calculate the theoretical temperature change of a specified mass of water or solution heated or cooled by a reaction, given molar enthalpies and quantities of reactants.		

Topic 3.2: Fuels

<i>Expectation</i>	<i>Summary of things I know about this</i>	<i>Example question(s) to practice</i>
Describe the advantages and disadvantages of the use of carbon-based fuels as sources of heat energy, compared with their use as feedstock.		Assignment 2 Q1 Test 1 Q3(a)(i)(ii)
Write balanced equations for the complete combustion of fuels in which the only products are carbon dioxide and water.		Assignment 2 Q3
Describe the undesirable consequences of incomplete combustion.		Assignment 2 Q2 Test 1 Q(b)
Calculate the quantities of heat evolved per mole, per gram, and per litre (for liquids) for the complete combustion of fuels.		Assignment 4 Q1, Q2 Test 1 Q3(a)(iv)

Topic 3.3: Electrochemistry

<i>Expectation</i>	<i>Summary of things I know about this</i>	<i>Example question(s) to practice</i>
Identify a cell as galvanic or electrolytic, given sufficient information.		Assignment 3 Q1 Test 1 Q4(f)
Write half-equations for half-reactions, including those in acidic solution, given information about the reactants and the products.		Assignment 3 Q2(a), Q3(c) Test 1 Q4(b)
Identify the anode and cathode in a galvanic cell or an electrolytic cell, given information about the reactants and the products.		Assignment 3 Q2(a), 3(b)(c) Test 1 Q4(a)
Identify the: · charge on the electrodes · direction of electron flow · movement of ions in the salt bridge or electrolyte given a sketch for a galvanic cell and information about electrode reactions.		Assignment 3 Q2(b), 3(a), 4(a) Test 1 Q4(c)(d)(e)
State the advantages and disadvantages of fuel cells compared with other galvanic cells.		Assignment 3 Q5 Test 1 Q4(h)
Describe the complementary nature of the charging and discharging of rechargeable galvanic cells.		Assignment 3 Q6
Describe, with the aid of equations, the electrolytic production of active metals.		Assignment 3 Q7 Test 2 Q3(b)

Topic 3.4: Rate of Reaction

<i>Expectation</i>	<i>Summary of things I know about this</i>	<i>Example question(s) to practice</i>
Determine the effect of varying conditions on the rate of a given reaction, using experimental data.		Assignment 4 Q6(b)(d)
Draw and interpret graphs representing changes in quantities or concentration of reactants or products against time.		Assignment 4 Q6(c) Assignment 5 Q4(e) Test 2 Q2(a)
Predict and explain the effect that changes in condition have on the rates of reactions in terms of the: <ul style="list-style-type: none">· frequency of collisions between reactant particles· orientation of colliding particles· energy of colliding particles· activation energy.		Assignment 4 Q3 Test 2 Q2(b),(c)
Draw and interpret energy profile diagrams that show the relative enthalpies of reactants and products, the activation energy, and the enthalpy change for the reaction.		Assignment 4 Q4 Test 2 Q1

Topic 3.5: Chemical Equilibrium

<i>Expectation</i>	<i>Summary of things I know about this</i>	<i>Example question(s) to practice</i>
Describe the dynamic nature of a chemical system at equilibrium.		Assignment 5 Q1(b)
Write K_c expressions that correspond to given reaction equations, and perform calculations involving K_c and equilibrium concentrations in which all reacting species are included in the expression.		Assignment 5 Q2 Assignment 5 Q3(b), Q4(c) Test 2 Q5(b),(c)(d)
Draw and interpret graphs representing changes in concentration of reactants and products against time.		Assignment 5 Q4(e)
Calculate the initial and/or equilibrium concentrations or quantities of reactants and products, given sufficient information about a particular system initially and/or at equilibrium.		Assignment 5 Q3(a)
Predict, using Le Châtelier's principle, the effect on the equilibrium position of a system of a change in the: <ul style="list-style-type: none">· concentration of a reactant or product· overall pressure of a gaseous mixture· temperature of an equilibrium mixture for which the ΔH value for the forward or back reaction is specified.		Assignment 5 Q3(c), Q4 Test 2 Q5(e)

Topic 3.6: Chemical Industry

<i>Expectation</i>	<i>Summary of things I know about this</i>	<i>Example question(s) to practice</i>
Explain the reaction conditions that will maximise yield.		Assignment 5 Q5 Test 2 Q(f)
Interpret flow charts and use them for such purposes as identifying: raw materials; chemicals present at different steps in the process; waste products; and by-products.		Assignment 6 Q1

Topic 3.7: Metal Production

<i>Expectation</i>	<i>Summary of things I know about this</i>	<i>Example question(s) to practice</i>
Predict whether a metal is likely to occur in nature uncombined or combined with other elements, given the relative position of the metal in a table of metal reactivities.		Assignment 6 Q2 Test 2 Q3(a)
Identify the stages in the production of a metal from its ore and explain why not all stages are necessary in the production of some metals.		Assignment 6 Q3 Test 2 Q3(c),(d)
Describe, with the aid of equations, the production of zinc from its ore.		Assignment 6 Q4 Test 2 Q4
Explain why the production of aluminium requires a molten non-aqueous electrolyte.		Assignment 6 Q5(a) Test 2 Q3(e)
Explain why zinc and iron can be obtained by reduction using carbon whereas this is not possible for aluminium.		Assignment 6 Q5(b)
Predict the likely method of reduction of a metal compound to the metal, given the position of the metal in the activity series of metals.		Assignment 6 Q6(c) Test 2 Q3(f)
Explain why reduction using electrolysis of an aqueous solution is preferable to electrolysis of a melt.		Assignment 6 Q5(a)