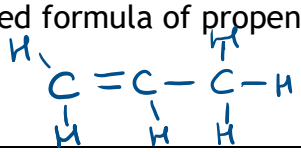
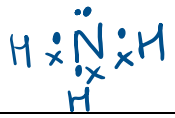
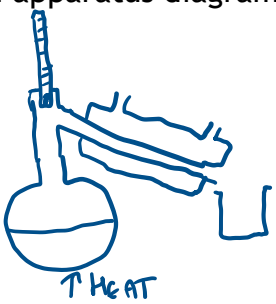
November Retrieval Practice: Year 12

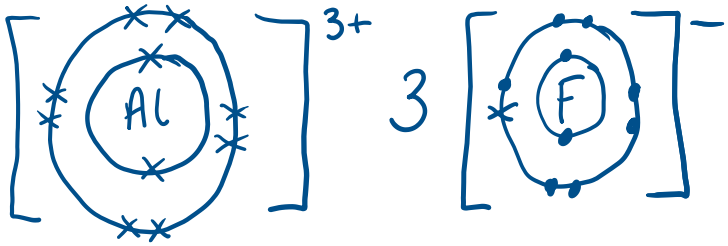
Rules: Never look at your notes for retrieval practice! Do as many as you can, even if they are educated guesses. When you have tried (hard!) to answer them all, check the mark scheme and rate each question:

- Easy, remembered perfectly
- Harder – could remember part of it or was familiar when I saw the answer
- Very hard – didn't recognise the answer so need to go back over this

	Question	Rating
1	Draw the displayed formula of propene	
2	Calculate the relative formula mass (M_r) of sodium sulfate	
3	Draw a dot and cross diagram to show the bonding in ammonia	
4	Draw an apparatus diagram for simple distillation	
5	Determine the empirical formula of the oxide formed when 13.64 grams of vanadium reacts completely in excess oxygen to form 48.72 g of the oxide.	
6	Name the compound Fe_2O_3	
7	Write an ionic equation for the reaction between sodium hydroxide and sulfuric acid	
8	Give two observations for the reaction between magnesium and hydrochloric acid	
9	Name the element in period 3 which has the following successive ionisation energies: 789, 1577, 3232, 4356, 16091, 19785	
10	Explain why sodium bromide has a lower melting point than sodium chloride	
11	Write a balanced equation for the complete combustion of hexane	
12	Give the physical states (at room temperature) and colours of each of the halogens chlorine, bromine and iodine	
13	Calculate the M_r of the hydrated compound $Na_2CO_3.xH_2O$, given that 6.38 g of the solid reacted completely with 22.3 cm^3 2.0 mol dm^{-3} HCl solution. Determine the value of x.	
14	Draw a dot and cross diagram for the ionic compound aluminium fluoride, showing all the electron shells.	
15	Define exothermic and give an example of an exothermic reaction.	

Answers:

	Question	Rating
1	Draw the displayed formula of propene 	☺ 😐 ☹
2	Calculate the relative formula mass (M_r) of sodium sulfate Formula: Na_2SO_4 M_r = 142.1	☺ 😐 ☹
3	Draw a dot and cross diagram to show the bonding in ammonia 	☺ 😐 ☹
4	Draw an apparatus diagram for simple distillation 	☺ 😐 ☹
5	Determine the empirical formula of the oxide formed when 13.64 grams of vanadium reacts completely in excess oxygen to form 48.72 g of the oxide. V O Mass 13.64 35.08 A_r 50.9 16 Moles 0.268 0.670 Ratio 1 2.5 Empirical formula: V_2O_5	☺ 😐 ☹
6	Name the compound Fe_2O_3 Iron (III) oxide	☺ 😐 ☹
7	Write an ionic equation for the reaction between sodium hydroxide and sulfuric acid $H^+ + OH^- \rightarrow H_2O$ You could also write $2H^+ + 2OH^- \rightarrow 2H_2O$	☺ 😐 ☹
8	Give two observations for the reaction between magnesium and hydrochloric acid Bubbles/fizzing/effervescence (this is only one observation!) The metal disappears/gets smaller	☺ 😐 ☹
9	Name the element in period 3 which has the following successive ionisation energies: 789, 1577, 3232, 4356, 16091, 19785 Silicon (there is a large increase in ionisation energies between the 4th and 5th electron so it is in group 4, period 3)	☺ 😐 ☹

10	Explain why sodium bromide has a lower melting point than sodium chloride The bromide **ion** is larger / Br- has larger ionic radius The electrostatic attractions between ions in the lattice are therefore weaker in NaBr so less energy is needed to overcome them (or vice versa for NaCl).	☺ 😐 ☹
11	Write a balanced equation for the complete combustion of hexane $C_6H_{14} + 9.5\ O_2 \rightarrow 6\ CO_2 + 7\ H_2O$ OR: $2C_6H_{14} + 19O_2 \rightarrow 12\ CO_2 + 14\ H_2O$	☺ 😐 ☹
12	Give the physical states (at room temperature) and colours of each of the halogens chlorine, bromine and iodine Chlorine: green gas Bromine: red/brown liquid Iodine: grey solid	☺ 😐 ☹
13	Calculate the M_r of the hydrated compound $Na_2CO_3.xH_2O$, given that 6.38 g of the solid reacted completely with 22.3 cm^3 2.0 mol dm^{-3} HCl solution. Determine the value of x. Mol HCl = 22.3/1000 x 2 = 0.0446 Ratio in equation: 2HCl: Na_2CO_3 Therefore mol Na_2CO_3 = 0.0446 / 2 = 0.0223 Mr $Na_2CO_3.xH_2O$ = 6.38 / 0.0223 = 286 Mr Na_2CO_3 = 106 mass xH_2O = 286 – 106 = 180 Mr H_2O = 18 180/18 = 10 therefore x = 10	☺ 😐 ☹
14	Draw a dot and cross diagram for the ionic compound aluminium fluoride, showing all the electron shells. 	☺ 😐 ☹
15	Define exothermic and give an example of an exothermic reaction. Exothermic – a reaction or process that releases heat to the surroundings. Examples: combustion, neutralisation, displacement reactions	☺ 😐 ☹