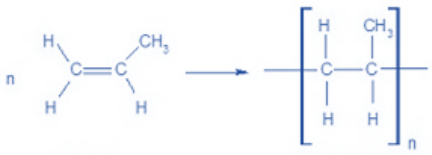
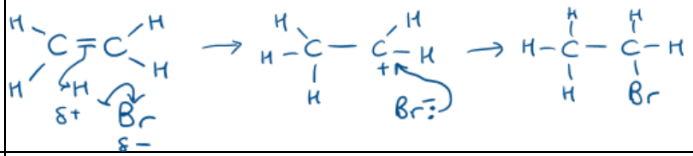
Retrieval Practice: Year 12 Number 21

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	Define relative atomic mass	
2	Write a balanced equation for reaction between calcium hydroxide and phosphoric acid, H_3PO_4	
3	Write equations to show the propagation steps for the reaction between ethane and chlorine to produce chloroethane	
4	Explain the trend in atomic radius as you go across period 3	
5	Calculate the percentage yield if 0.243 g magnesium reacts with excess acid to produce 1.80 g hydrated magnesium sulfate, $MgSO_4.7H_2O$	
6	Explain why hydrogen fluoride has a higher boiling point than hydrogen chloride.	
7	Describe how you would prepare a 250cm^3 standard solution of sodium hydroxide from a known mass of solid	
8	Write a balanced equation for the polymerisation of propene	
9	Draw the mechanism for the reaction between ethene and hydrogen bromide	
10	Give the bond angles around the carbon atom in the following molecules: CH_4, HCHO, CO_2	

Answers:

	Question	Rating
1	Define relative atomic mass *(weighted) average mass of an atom compared to 1/12th a carbon-12 atom*	
2	Write a balanced equation for reaction between calcium hydroxide and phosphoric acid, H_3PO_4 *$3Ca(OH)_2 + 2H_3PO_4 \rightarrow Ca_3(PO_4)_2 + 3H_2O$*	
3	Write equations to show the propagation steps for the reaction between ethane and chlorine to produce chloroethane *$C_2H_6 + Cl\bullet \rightarrow C_2H_5\bullet + HCl$* *$C_2H_5\bullet + Cl_2 \rightarrow C_2H_5Cl + Cl\bullet$*	
4	Explain the trend in atomic radius as you go across period 3 • *Atomic radius decreases* • *Nuclear charge increases; Same number of shells/similar shielding so increased force of attraction between nucleus and outer electrons*	
5	Calculate the percentage yield if 0.243 g magnesium reacts with excess acid to produce 1.80 g hydrated magnesium sulfate, $MgSO_4.7H_2O$ *Mol Mg = 0.243 / 24.3 = 0.01 Max mol $MgSO_4.7H_2O$ = 0.01* *Max mass $MgSO_4.7H_2O$ = 0.01 x 246.4 = 2.464* *Percentage yield = (1.80/2.464) x 100 = 73.1%*	
6	Explain why hydrogen fluoride has a higher boiling point than hydrogen chloride. *HF has hydrogen bonding, which is stronger than the permanent dipoles/dipole-dipole attractions in HCl so takes more energy to overcome*	
7	Describe how you would prepare a 250cm^3 standard solution of sodium hydroxide from a known mass of solid • *Weigh the solid, transfer to a beaker (then reweigh the container to find the mass added)* • *Add distilled water to dissolve the solid, transfer to volumetric flask* • *Rinse beaker and add this to flask* • *Make up to the line using a pipette* • *Stopper and shake the flask*	
8	Write a balanced equation for the polymerisation of propene 	
9	Draw the mechanism for the reaction between ethene and hydrogen bromide 	
10	Give the bond angles around the carbon atom in the following molecules: CH_4, HCHO, CO_2 *CH_4: 109.5 HCHO: 120 CO_2: 180*	