Retrieval Practice: Year 12 Number 16

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	Explain why magnesium has a higher first ionisation energy than aluminium	☺ ☹ ☹
2	Draw a dot and cross diagram of an ethene molecule	☺ ☹ ☹
3	Calculate the volume of 0.10 moldm^{-3} hydrochloric acid needed to react with 1.40 g calcium oxide	☺ ☹ ☹
4	Draw a displayed formula for propan-2-ol	☺ ☹ ☹
5	Write a balanced equation for the complete combustion of propan-1-ol	☺ ☹ ☹
6	Calculate the volume, in cm^3, occupied by 0.44 g carbon dioxide at 95°C and 100 kPa pressure	☺ ☹ ☹
7	Describe a test for bromide ions	☺ ☹ ☹
8	Write a balanced equation for the reaction between sodium and water	☺ ☹ ☹
9	Give the oxidation state of sulfur in: SO_2, H_2S and H_2SO_4	☺ ☹ ☹
10	Calculate the value of x in hydrated magnesium sulfate, $MgSO_4.xH_2O$, if 29.57 g hydrated salt was heated to produce 14.45 g anhydrous salt	☺ ☹ ☹

Answers:

	Question
1	Explain why magnesium has a higher first ionisation energy than aluminium • *Electron removed from magnesium is in 3s, from aluminium is in 3p* • *3s is lower in energy/closer to the nucleus* • *Electron removed from Mg is more strongly attracted to the nucleus and takes more energy to remove*
2	Draw a dot and cross diagram of an ethene molecule
3	Calculate the volume of 0.10 moldm^{-3} hydrochloric acid needed to react with 1.40 g calcium oxide *Moles CaO = 1.4 / 56.1 = 0.025* *Mol HCl needed = 2 x 0.025 = 0.05 mol* *Volume in dm^3 = 0.05/0.1 = 0.5 dm^3 (or 500 cm^3)*
4	Draw a displayed formula for propan-2-ol
5	Write a balanced equation for the complete combustion of propan-1-ol *$C_3H_7OH + 4.5\ O_2 \rightarrow 3CO_2 + 4H_2O$*
6	Calculate the volume, in cm^3, occupied by 0.44 g carbon dioxide at 95°C and 100 kPa pressure *n = 0.44/44 = 0.01 mol T = 368 K P = 100 000 Pa* *V (in m^3) = nRT/P = (0.01 x 8.31 x 368) / 100 000 = 3.058 x 10^{-4}* *V in cm^3 = 306 cm^3*
7	Describe a test for bromide ions *Add nitric acid and aqueous silver nitrate* *Produces a cream precipitate*
8	Write a balanced equation for the reaction between sodium and water *$2Na + 2H_2O \rightarrow 2NaOH + H_2$*
9	Give the oxidation state of sulfur in: SO_2, H_2S and H_2SO_4 *SO_2 : + 4 H_2S : -2 and H_2SO_4 : +6*
10	Calculate the value of x in hydrated magnesium sulfate, $MgSO_4.xH_2O$, if 29.57 g hydrated salt was heated to produce 14.45 g anhydrous salt *Mol anhydrous $MgSO_4$ = 14.45 / 120.4 = 0.120 mol* *Mass H_2O removed = 29.57 – 14.45 = 15.12 g* *Mol H_2O removed = 15.12 / 18 = 0.840 mol* *0.84/0.12 = 7 therefore **x = 7***