Retrieval Practice: Year 12 Number 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:

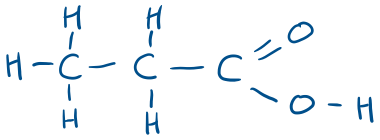
 Easy, remembered perfectly

 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	Define first ionisation energy	
2	Calculate the mass of Na_2CO_3 needed to completely neutralise 25 cm^3 1.0 $moldm^{-3}$ HNO_3	
3	Draw the displayed formula of propanoic acid	
4	Write an equation for the reaction between sodium bromide and chlorine	
5	Draw a dot and cross diagram for carbon dioxide	
6	Calculate the volume in cm^3 of 0.42 grams of nitrogen gas at 300 K and 200 kPa pressure	
7	Describe and explain the trend in boiling points down group 7	
8	Explain why increasing temperature increases the rate of a chemical reaction	
9	Define dative/coordinate bonding	
10	Describe a test for carbonate ions	

Answers:

	Question
1	Define first ionisation energy *The energy required to remove the outer electron from each atom in a mole of gaseous atoms*
2	Calculate the mass of Na_2CO_3 needed to completely neutralise 25 cm^3 1.0 $moldm^{-3}$ HNO_3 *Moles HNO_3 = 1 x 25/1000 = 0.025 mol* *Moles Na_2CO_3 = 0.025/2 = 0.0125 Mr = 106* *Mass = 0.0125 x 106 = 1.325 g*
3	Draw the displayed formula of propanoic acid 
4	Write an equation for the reaction between sodium bromide and chlorine *Either: $2NaBr + Cl_2 \rightarrow Br_2 + 2NaCl$* *Or: $2Br^- + Cl_2 \rightarrow Br_2 + 2Cl^-$*
5	Draw a dot and cross diagram for carbon dioxide 
6	Calculate the volume in cm^3 of 0.42 grams of nitrogen gas at 300 K and 200 kPa pressure *Mol N_2 = 0.42/28 = 0.015 P = 200 000 Pa* *V = nRT/P = (0.015 x 8.31 x 300)/200 000 = 1.87 x 10^{-4} m^3* *V in cm^3 = 1.87 x 10^{-4} x 10^6 = 187 cm^3*
7	Describe and explain the trend in boiling points down group 7 • *Boiling points increase down the group* • *Molecules get larger/have more electrons* • *Strength of intermolecular/London forces increases* • *So more energy to overcome*
8	Explain why increasing temperature increases the rate of a chemical reaction • *Particles gain more kinetic energy* • *More frequent collisions* • *More particles have at least the activation energy* • *Therefore more successful collisions per second*
9	Define dative/coordinate bonding *A covalent bond in which both electrons are donated by one atom*
10	Describe a test for carbonate ions *Add (hydrochloric) acid* *Fizzing/bubbles/effervescence* *Could also bubble the gas produced through lime water to confirm the presence of carbon dioxide - turns milky*