


































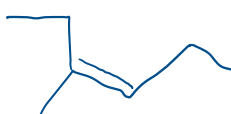


















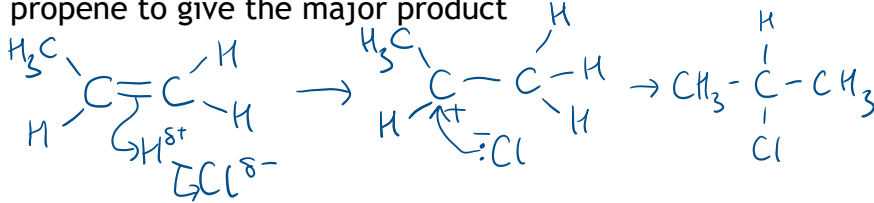












Retrieval Practice: Year 13 number 16

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	Draw the skeletal formula for (Z) 2,3-dimethylhex-3-ene.	  
2	Calculate the mass of iodine that would react with 0.1 moles of cyclohexa-1,3-diene	  
3	Write a balanced equation for the reaction between barium oxide and water	  
4	Calculate the pH of a 0.1 mol dm ⁻³ solution of ethanoic acid (K _a = 1.7 × 10 ⁻⁵ mol dm ⁻³)	  
5	Give the colour of phenolphthalein in the presence of acid and alkali	  
6	Write a balanced equation for the redox reaction between MnO ₄ ⁻ ions and C ₂ O ₄ ²⁻ ions in acidic solution to produce Mn ²⁺ and carbon dioxide	  
7	Draw the mechanism for the reaction between HCl and propene to give the major product	  
8	Give the reagents and conditions for the preparation of chlorobenzene from benzene	  
9	Explain why silicon dioxide has a higher boiling point than carbon dioxide	  
10	Calculate the percentage yield when 510 g ammonia are made by reacting 1400 g nitrogen with excess hydrogen	  

Answers:

	Question	Rating
1	<p>Draw the skeletal formula for (Z) 2,3-dimethylhex-3-ene.</p> 	  
2	<p>Calculate the mass of iodine that would react with 0.1 moles of cyclohexa-1,3-diene</p> <p><i>0.2 moles of iodine needed (2 double bonds)</i></p> <p><i>Mr = 253.8</i></p> <p><i>Mass = 0.2 x 253.8 = 50.76g</i></p>	  
3	<p>Write a balanced equation for the reaction between barium oxide and water</p> <p><i>BaO + H₂O → Ba(OH)₂</i></p>	  
4	<p>Calculate the pH of a 0.1mol dm⁻³ solution of ethanoic acid (K_a = 1.7 x 10⁻⁵ mol dm⁻³)</p> <p><i>K_a = [H⁺]² / [HA]</i></p> <p><i>[H⁺] = √(1.7 x 10⁻⁵ x 0.1) = 1.30 x 10⁻³</i></p> <p><i>pH = 2.88</i></p>	  
5	<p>Give the colour of phenolphthalein in the presence of acid and alkali</p> <p><i>Acid: colourless, alkali: pink/red</i></p>	  
6	<p>Write a balanced equation for the redox reaction between MnO₄⁻ ions and C₂O₄²⁻ ions in acidic solution to produce Mn²⁺ and carbon dioxide</p> <p><i>2MnO₄⁻ + 5C₂O₄²⁻ + 16H⁺ → 2Mn²⁺ + 5CO₂ + 8H₂O</i></p>	  
7	<p>Draw the mechanism for the reaction between HCl and propene to give the major product</p> 	  
8	<p>Give the reagents and conditions for the preparation of chlorobenzene from benzene</p> <p><i>Chlorine in the presence of aluminium chloride catalyst, dry ether solvent, reflux</i></p>	  
9	<p>Explain why silicon dioxide has a higher boiling point than carbon dioxide</p> <ul style="list-style-type: none"> <i>Silicon dioxide has a giant covalent structure</i> <i>Lots of energy needed to break strong covalent bonds</i> <i>Carbon dioxide is covalent molecular</i> <i>Little energy needed to overcome weak intermolecular forces</i> 	  
10	<p>Calculate the percentage yield when 510 g ammonia are made by reacting 1400 g nitrogen with excess hydrogen</p> <p><i>N₂ + 3H₂ → 2NH₃</i></p>	  

	<i>Moles $N_2 = 1400/28 = 50$ Max moles $NH_3 = 100$ so max mass $NH_3 = 1700g$ Yield = $510/1700 \times 100 = 30\%$</i>	
--	--	--