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| Topic heading | Syllabus Ref | Idea cluster | Question 1 | Question 2 | Question 3 | Question 4 |
| Chemical analysis | GCSE CQu (1) | Purity and chromatography | How do you calculate an Rf value?   1. Distance moved by the solvent divided by the distance moved by substance. 2. Distance moved by the substance divided by distance moved by solvent. 3. Distance moved by substance multiplied by the distance moved by solvent. 4. Distance moved by the solvent –distance moved by the solute. | Why is salt added to icy roads in winter?   1. Salt is an impurity and changes the melting point of the ice. 2. Water has a higher melting point than salt. 3. Salt makes the mixture purer. 4. The salt increases the melting temperature of the water. | Why should the line you place the substance on in chromatography be drawn with a pencil?   1. Graphite in pencil leads is an unreactive substance 2. It will give a better separation of the substance being tested. 3. Graphite in pencils is insoluble in water. 4. Graphite in pencils is soluble in water. | What is the Rf value for the top spot on this chromatogram?  http://home.earthlink.net/~dayvdanls/photolab/TLC3.GIF   1. 1.09 2. 0.5 3. 3 4. 0.92 |
|  |  |  | B | A | C | D |
| Chemical analysis | GCSE CQu (2) | Analytical techniques | In a flame test a compound produces a lilac flame. Which metal ion is present?   1. Lithium 2. Sodium 3. Copper 4. Potassium | If a compound produces a yellow flame in a flame test and produces a white precipitate with barium chloride, which compound is it?   1. Potassium chloride 2. Copper sulphate 3. Sodium sulphate 4. Sodium nitrate | Which of the following is a test for oxygen?   1. Oxygen relights a glowing splint 2. Limewater goes cloudy if oxygen is bubbled through it 3. A lit splint explodes with a squeaky pop in oxygen. 4. A lit splint is extinguished in the presence of oxygen. | Which halide ion is produces a cream precipitate with silver nitrate solution?   1. Fluoride 2. Chloride 3. Bromide 4. Iodide |
|  |  |  | D | C | A | B |
|  |  | Gas tests | A chemical reaction fizzes. The gas is bubbled through limewater, which ***does not*** turn cloudy. Which of the statements below is true?   1. The gas is oxygen. 2. The gas can’t be carbon dioxide. 3. The gas will explode. 4. The gas is not hydrogen. | A gas produces a squeaky pop when a lighted splint is placed in it. What is the name of this gas?   1. Hydrogen 2. H2 3. Chlorine 4. Cl2 | A gas was tested with damp universal indicator paper and was found to be chlorine. What happened in this test?   1. The paper turns blue. 2. The paper turns white and then blue. 3. The paper turns red and then white. 4. The paper turns white and then red. | A gas jar contained pure oxygen. Some iron wool was heated strongly with a Bunsen burner and then lowered into the gas jar. What would have been observed?   1. The iron wool will explode. 2. The iron wool will glow more brightly. 3. The iron wool will go out. 4. The iron wool will glow a pale blue / green |
|  |  |  | D | A | C | B |
| Chemistry of the atmosphere | GCSE CQu (3) | How has the atmosphere evolved | Which gas was the Earth’s atmosphere mostly made of?   1. nitrogen 2. methane 3. ammonia 4. carbon dioxide | What caused the amount of oxygen to increase in the earth’s atmosphere?   1. Combustion 2. Respiration 3. Photosynthesis 4. Decay | What is the gas that makes up most of Earth’s current atmosphere?   1. Nitrogen 2. Oxygen 3. Carbon dioxide 4. Hydrogen | Where did the water come from that condensed to form the oceans?   1. Algae 2. Plants 3. Micro-organisms 4. Volcanoes |
|  |  |  | D | C | A | D |
|  | GCSE CQu (4) | Human effects on the atmosphere | Which of the following is a powerful greenhouse gas?   1. Argon 2. Hydrogen 3. Methane 4. Ozone | Which of these is a likely effect of global climate change?   1. A decrease in ozone. 2. Rising sea levels. 3. Human population growth. 4. An increase in acid rain. | What causes global dimming?   1. Particulates in the atmosphere. 2. Overuse of pesticides. 3. Increasing carbon dioxide levels. 4. Increasing sulphur dioxide levels. | What process is a major source of atmospheric pollution?   1. Deforestation 2. Respiration 3. Phytomining 4. Combustion |
|  |  |  | C | B | A | D |
| Quantitative Chemistry | GCSE CQu (5) | Calculating chemical amounts | What is the mass of one mole of Sodium atoms?   1. 30g 2. 23g 3. 10g 4. 11g | Consider the reaction:  Mg + 2HCl → MgCl2 + H2  Which of the following statements about this reaction is true?   1. 1 mole of Mg reacts with 2 moles of hydrochloric acid. 2. The mass of products is bigger than the reactants. 3. 2 moles of hydrogen gas are produced for every mole of Mg reacted. 4. The magnesium and hydrochloric acid react in a 1:1 ratio | Which of these is the standard unit of concentration?   1. mol/ml3 2. mol/dm3 3. mol/g3 4. mol/cm3 | At standard temperature and pressure, what will the volume of 2 moles of hydrogen gas be?   1. 24dm3 2. 12dm3 3. 48dm3 4. 36dm3 |
|  |  |  | B | D | B | C |
|  | GCSE CQu (6) | Maximising chemical reactions | Which of the equations defines percentage yield?   1. % yield = mass of product x theoretical mass of product x100 2. % yield = maximum theoretical mass of product divided by mass of product actually made x 100 3. % yield = RFM of product divided by theoretical mass of product x 100 4. % yield = mass of product divided by the theoretical mass of products x 100 | A student heats 0.3g of magnesium in air and makes 0.4g of product. The theoretical yield is 0.5g. What is the percentage yield of the reaction?   1. 75% 2. 125% 3. 80% 4. 60% | Why is the atom economy for the following reaction 100%?  H2 + O2 → H2O   1. Because every reactant atom is present in the product. 2. Because the equation is balanced. 3. The product is not harmful 4. The yield is 100% | Why is it important in industry that yield and atom economy are as high as possible?   1. To ensure that no dangerous chemicals are made 2. To ensure that the reaction is as cost effective as possible 3. To ensure that the law of conservation of mass is followed. 4. To make sure that the correct ratio of products was made. |
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