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SPECA

GCSE Combined Science (AQA Trilogy) · Chemistry

Chemical Analysis · Mark Scheme

For use with the Worksheet. Marking points are indicative, not exhaustive: award equivalent correct answers.

1) A pure substance is a single element or compound with nothing else mixed in (1); orange juice is chemically a mixture of water, sugars, acids and other substances, even though nothing artificial has been added (1) [2]

2) A pure substance melts/boils at one specific, sharp temperature (1); a mixture melts/boils over a range of temperatures (1) [2]

3) A mixture designed as a useful product, made by combining components in carefully measured quantities to give it required properties (1) [1]

4) Yes, it is a formulation (1); because it is a mixture of components (solvent, surfactant, fragrance) combined in measured quantities to produce a product with specific properties (1) [2]

5) Any two of: fuels; paints; medicines; alloys; fertilisers; foods (1 mark each, max 2) [2]

6) Stationary phase: the chromatography paper (1); mobile phase: the solvent (1) [2]

7) Rf = 3.6 ÷ 9.0 (1) = 0.40 (1) [2]

8) Distance moved = Rf × solvent front distance = 0.75 × 9.0 (1) = 6.75 cm (1) [2]

9) This suggests substance Z is a pure substance (1), since a mixture could be expected to separate into more than one spot in at least one solvent (1) [2]

10) Substance W is a mixture of (at least) three different substances (1) [1]

11) Hold a lit splint at the mouth of the test tube (1); positive result: a rapid 'pop' (1) [2]

12) Insert a glowing splint into the test tube (1); positive result: the splint relights (1) [2]

13) Bubble/shake the gas through limewater (aqueous calcium hydroxide) (1); positive result: the limewater turns cloudy/milky (1) [2]

14) Hold damp litmus paper in the gas (1); positive result: the litmus paper is bleached white (1) [2]

15) Oxygen (1) [1]

16) 'Clear' is wrong because limewater starts off clear/colourless: the correct positive result is the opposite: the limewater turns cloudy/milky (1); the correct observation is that the limewater turned cloudy/milky (1) [2]

Total: 29 marks

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