ANSWERS: Reactions of haloalkanes

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| **2019** | **Evidence** | **Achievement** | **Merit** | **Excellence** |
|  | Compound **B** reacting with bromine water will be a slow reaction requiring UV light as a catalyst. It will form 1-bromobutane / 2-bromobutane and HBr. The bromine water will decolourise from a red-brown / orange / brown / yellow colour. This is a substitution reaction where the H on one carbon is substituted by a Br atom. The H atom that is removed bonds with the remaining Br atom to form hydrogen bromide. Compound **A** reacting with bromine water is a fast reaction, forming 2,3-dibromobutane. The bromine water decolourises from a red-brown colour. This is an addition reaction, where the double bond is broken and two Br atoms are added. | • Identifies the two types of  reaction occurring.  OR  States the colour change. | • Explains the type of reaction  linked to observations for **A** or **B**. | • Compares and contrasts all aspects of the reactions for **A** and **B**. |

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| **2018** | **Evidence** | **Achievement** | **Merit** | **Excellence** |
|  | A reaction with dilute aqueous KOH will produce an alcohol, propan-2-ol.    This is a substitution reaction. The Cl atom is substituted by an OH group.  If concentrated KOH(*alc*) is used, an elimination reaction occurs, and the  2-chloropropane forms propene because a H and a Cl atom will be removed, whilst a double bond is formed. | • Identifies one product (name or structure)  • Identifies one type of reaction with correct reagent and product (can be in a structural formula). | • Explains ONE type of reaction linked to correct reagent condition and  organic product. | • Elaborates on both reactions of 2- chloropropane, referring to reaction type, conditions, and products. |

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| **2017** | **Evidence** | **Achievement** | **Merit** | **Excellence** |
| (i)  (ii) | The organic product contains a double bond, it is an alkene and could be identified by reacting with Br2(*aq*), the orange solution will decolourise when reacted with an alkene;  or react with KMnO4, a purple solution that will turn brown when it reacts with an alkene. | Identifies the organic product correctly.  OR  Describes a way of identifying the presence of the double bond. | Explains how to identify the presence of a C=C functional group, including observations and correct structure. |  |

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| **2014** | **Evidence** | **Achievement** | **Merit** | **Excellence** |
| (i)  (ii) | A Substitution reaction. An atom is replaced with another group of atoms.  The Cl atom is replaced by NH2. No conditions are required. | States substitution reaction | Explains substitution reactions in terms of atoms  or groups of atoms being replaced. |  |

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