Tests for identifying Organic substances

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **water** | **Na2CO3 (aq)** | **Mg or Zn** | **conc NaOH or HCl** | **Br2 (aq)** | **acidified**  **MnO4-** | **acidified**  **Cr2O7 2-** | **Universal indicator** | **DAMP litmus paper** |
| **alkane** | | immiscible,  alkane floats on top,  two different layers are visible | immiscible,  alkane floats on top, two different layers |  |  | orange 🡪 colourless  after 10 mins in light  substitution reaction  2 products formed  (HBr and  1-bromoalkane |  |  |  |  |
| **alkene** | | immiscible,  alkene floats on top, two different layers are visible | immiscible,  alkene floats on top, two different layers |  |  | orange 🡪 colourless  immediately  addition reaction  1 product formed; dibromoalkane | purple 🡪 colourless  oxidation reaction  diol formed |  |  |  |
| **alcohol (primary & secondary)** | | soluble  (up to 5 carbon atoms in chain length) | soluble  (up to 5 carbon atoms in chain length) |  |  |  | purple 🡪 colourless  oxidation reaction  carboxylic acid formed | orange 🡪 green  oxidation reaction  carboxylic acid formed | **green** neutral |  |
| **carboxylic acid** | | soluble  (up to 5 carbon atoms in chain length) | neutralisation reaction,  bubbling  salt\*\*, water and carbon dioxide formed | bubbling  as hydrogen gas formed  as well as a  salt and water | neutralisation reaction  with NaOH to form  sodium salt of the acid |  |  |  | **orange** or  **yellow** weak acid | **blue** litmus turns **red** |
| **amine** | | soluble  (up to 5 carbon atoms in chain length) | soluble  (up to 5 carbon atoms in chain length) |  | neutralisation reaction  with HCl to form  ammonium chloride salt |  |  |  | **blue** weak base | **red** litmus turns **blue** |

\* water is a polar molecule, many organic substances eg *bromine water, hexane* are non-polar

polar and non-polar substances do not dissolve in each other, because of this, two layers form as polar and non-polar layers do not mix.

\*\* sodium ethanoate (with ethanoic acid, sodium propanoate (with propanoic acid)

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