

HALOALKANES

General formula

Naming and classifying

Physical Properties:

Are _____ with _____ and _____.

Therefore, they have _____ boiling points.

Chloromethane is a _____ at room temperature.

Iodomethane is a _____ at room temperature. This indicates that the _____ of the C-Hal bond is not the major factor in boiling point (the polarity of the C-Hal bond down the group). Rather it is the increase in _____ forces down the group because the _____ atom gets bigger therefore there are _____ and therefore, an _____ in London Forces _____ molecules.

They are _____ soluble in water. They cannot form _____ with the water.

Reactions:

In reactions the haloalkane needs to be dissolved in . The ethanol is used as a to make there haloalkane and water mix.

Hydrolysis reaction:

Reaction:

Conditions:

Water on its own can be used, but adding an alkali makes the reaction much quicker.

Reaction Mechanism:

1. The is attracted to the atom. A dative covalent bond forms. This is known as attack.
2. The covalent bond between the C-Hal to form a negatively charged ion. This is via .

Nucleophile: a pair of .

Rates of hydrolysis

As you go down group seven the rate at which haloalkanes hydrolyse .
Iodoethane reacts much quicker than chloroethane.

This is because the enthalpy of the C-Hal bond as you go down the group.

Bond	Bond enthalpy/KJmol ⁻¹

This means rate of hydrolysis is dependedent on !

This can be shown through experimental observations.

1. To three separate test tubes add chlorobutane, bromobutane, iodobutane.
2. Add .
3. Observe when a is formed in each test tube.

acts as a .

acts as the .

reacts with the to form the (the observable reaction).

What is happening in the reaction above?

Keep the test fair:

1. Use _____ of the haloalkane.
2. Use haloalkanes with the same _____ length.
3. Use a _____ to keep a _____ temperature.

Uses

Haloalkanes are used to make different types of _____ .

CFC's

Chlorofluorocarbons used to be used in _____ and _____ cans however they damage the _____ , therefore their use has been stopped.

Ozone layer

The ozone layer stops harmful UV radiation reaching earth. Excess amounts of UV radiation can cause sunburn and _____ .

Ozone:

Ozone exists in equilibrium as shown above.

At high altitude oxygen molecules, through photodissociation by U.V light.

An oxygen free radical reacts with an oxygen molecule to produce ozone.

Holes in the ozone layer

The ozone layer has been thinning because ozone can react with chlorine free radicals and from CFC's and nitrogen free radicals from thunderstorms.

Chlorine free radicals

Initiation

Propagation:

The chlorine free radical can be considered a .

Nitrogen free radicals

Propagation:

The nitrogen free radical can be considered a .

Questions

1. 2-bromopropane reacts with an aqueous alkali.
 - a) Write the overall chemical reaction equation.

 - b) Describe the mechanism. State what type of reaction is occurring.

 - c) Describe a test that could be carried to determine the rate of hydrolysis of the haloalkanes down group seven, using 2-bromopropane as one of your reagents.