

The properties of the halogens

Education in Chemistry

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rsc.li/EiC118-preciouswater

Extension questions with answers, ages 14–16

1. Bromine is often more effective than chlorine at killing bacteria found in swimming pools. It is commonly used to disinfect hot tubs. Suggest why, despite its superior antibacterial action, bromine isn't used in swimming pools.

Bromine dissolved in water is an orange solution. People might not find orange-coloured pool water attractive to swim in. They may think it is dirty or worry it would stain their skin.

2. Compounds of chlorine, rather than chlorine itself, are added to swimming pools to help keep the water clean. Using knowledge about its physical properties, suggest why elemental chlorine is not used in swimming pools.

Chlorine is a gas at room temperature so to use chlorine in the swimming pool you would have to bubble a gas through the water. This would be difficult to handle and also difficult to monitor in the pool. If swimming pool users saw the bottles of gas they might be worried because they would be labelled as 'toxic'.

3. Surgeons swab patients' skin before surgery with an iodine solution. Suggest why iodine is used for this purpose and not chlorine.

Iodine in water is a brown solution and it stains the skin. This is useful for surgeons as they can see the disinfected areas. Chlorine water is a very pale yellow solution so swabbed areas wouldn't be visible.