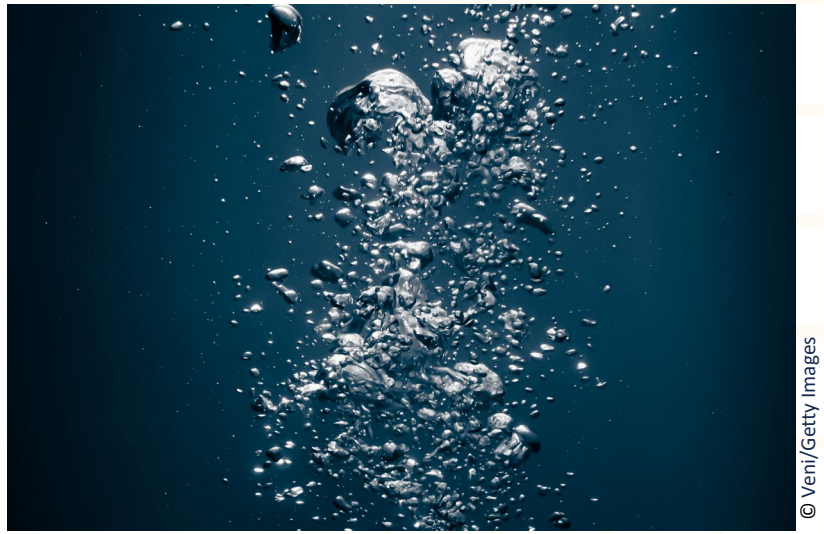
Chlorine could be used to reduce methane

Slide by Neil Goalby. Available from rsc.li/4i6Len2

Scientists have developed a way to reduce levels of the greenhouse gas methane using reactive atoms of chlorine. They have made a reactor that could be used in areas with high concentrations of methane in the air, such as at landfills. The electrolysis- based system would take methane from the air and bubble it through a chlorine-saturated brine derived from seawater. Chlorine atoms in the brine would oxidise methane to carbon dioxide. The team could then capture and store the byproducts, including chlorine and hydrogen gas.



The reactor uses chlorine atoms derived from seawater to oxidise methane to the less harmful carbon dioxide

Questions

1. What is the electronic structure of a chlorine atom?
2. Suggest why chlorine atoms are very reactive.
3. Suggest why the process could help tackle climate change even though it produces CO_2.