

### Quiz (Detecting the Presence of Molecules)

A student performed four experiments to collect some gaseous products.

The experiments were conducted as follows:

**Experiment 1:** Gas A was obtained by warming ammonium chloride with sodium hydroxide solution.

**Experiment 2:** Gas B was obtained by heating calcium carbonate strongly.

**Experiment 3:** Gas C was obtained by heating a mixture of sodium sulphite and dilute hydrochloric acid.

**Experiment 4:** Gas D was obtained by mixing chlorine bleach and dilute hydrochloric acid.

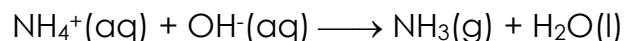
The gases obtained were collected in four different gas jars A, B, C and D.

(a) What are gases A, B, C and D? Write appropriate equations for their formation in the reactions.

(b) Suggest simple chemical tests to identify each of the gases.

## Suggested Answer

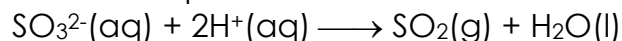
(a) Gas A is ammonia.



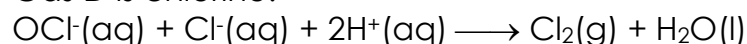
Gas B is carbon dioxide.



Gas C is sulphur dioxide.



Gas D is chlorine.



(b) Test for ammonia:

Test the gas with moist red litmus paper. The litmus paper turns blue in the presence of ammonia.

OR Place concentrated hydrochloric acid near the gas. A dense white fume forms when ammonia reacts with hydrogen chloride.

Test for carbon dioxide:

Test the gas by bubbling it through limewater. The limewater turns milky in the presence of carbon dioxide.

Test for sulphur dioxide:

Test the gas with filter paper soaked with acidified potassium dichromate solution. The filter paper changes from orange to green in the presence of sulphur dioxide.

Test for chlorine:

Test the gas with moist blue litmus paper. The litmus paper turns red and then white very quickly in the presence of chlorine.