

Chem sba 1



Name: Derell Ruan Form: 4B1 SBA: Chemistry Aim: To determine which gas, Ammonia or hydrogen chloride diffuses faster. Hypothesis: Ammonia will diffuse faster than hydrogen chloride. Materials Equipment: Chemicals:

- 2 retort clamp and stand Ammonia
- 1 7 m glass tube
- 2 250cm³ beakers
- Cotton Wool
- Stop clock
- Meter rule
- Tweezers

2 Rubber bung Method:

1. The equipment was collected.
2. The glass tube was placed between the two clamps ensuring that it was leveled.
3. A small amount of hydrochloric acid was poured into the beaker.
4. The cotton wool was placed at one end of the glass tube using tweezers. Seal it off with a rubber bung.
5. Repeating steps 3-5 simultaneously.
6. The stop clock was started, keeping record of time taken to the white cloud to form.
7. The meter rule was used to measure the distance of the white cloud from each end of the tube. Results

Interpretation of results: The purpose of the glass tube is to eliminate air currents and to let the gas molecules will move on their own. The gas molecules follow a path through the tube as they collide with the air

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molecules in the tube. Ammonia will diffuse faster because it has a faster rate of diffusion and it is almost twice as light as Hydrochloric acid.

A cloud like figure should show up when the gases collide. Conclusion: The reaction which is taking place is: ammonia + hydrogen chloride \rightarrow ammonium chloride $\text{NH}_3 (\text{g}) + \text{HCl} (\text{g}) \rightarrow \text{NH}_4\text{Cl} (\text{s})$ The exact time taken for the cloud to form depended on the dimensions of the tube, and the amount of the solutions which are put on the cotton wool. The cloud formed nearer to the hydrochloric acid end of the tube because ammonia diffuses faster than hydrochloric acid.

This is because hydrogen chloride has almost twice the molecular weight of ammonia, and the rate of diffusion is inversely proportional to the square root of the molecular mass of the gas. The hypothesis was correct and is proven by the results of the experiment and what was interpreted was also proven by the results of the experiment. Limitations: The experiment could not have been conducted several times enabling the results to be more accurate, because of the high risk that it could have done to the human body.