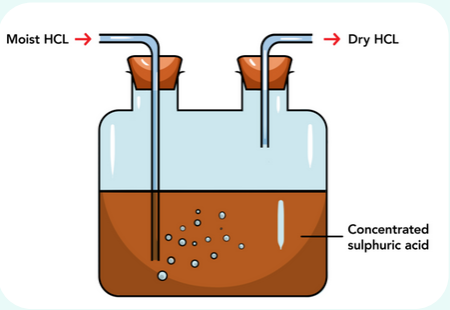
drying agents

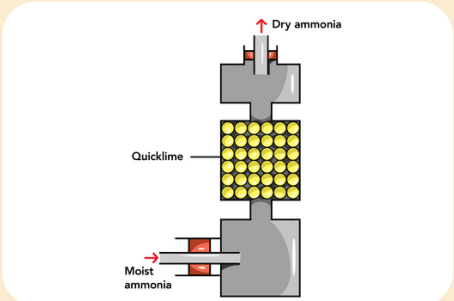
Drying agents are substances used to remove moisture from solvents e.g. ethanol or gases. e.g. NH_3

conc. H_2SO_4



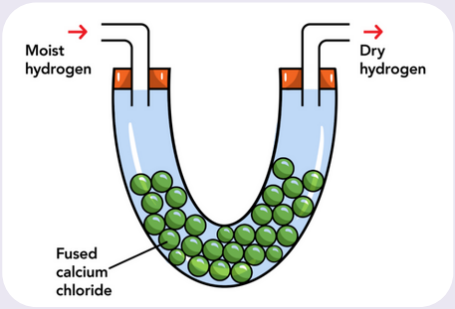
- It cannot be used to dry alkaline gases, such as ammonia, as it will react with the gas.
- The delivery tube for the gas must enter the acid, while the other tube should be positioned in the air above the acid.

calcium oxide (quicklime)



- It cannot be used to dry acidic gases, such as HC*l*, as it will react with the gas.

fused calcium chloride

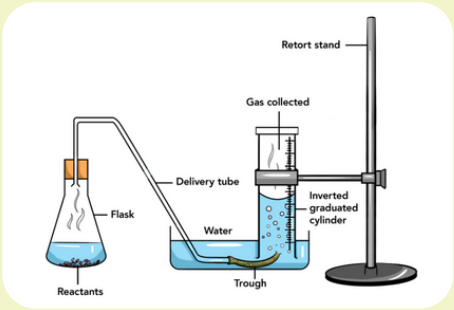


- Can be used to dry all gases

gas collection methods

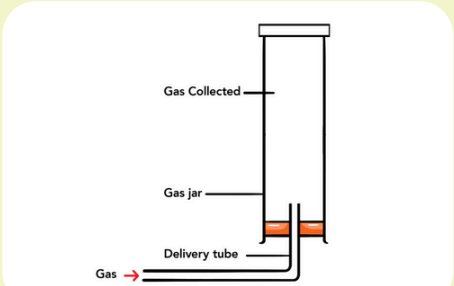
The method for collecting gas depends on: (1) the density of the gas relative to air and (2) the solubility of the gas in water

water displacement



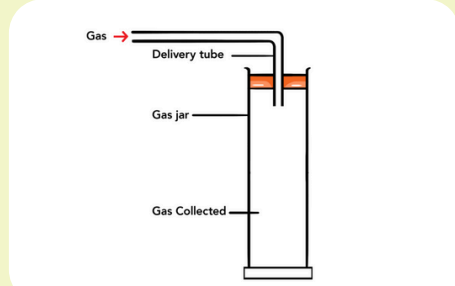
- For gases that are insoluble/slightly soluble
- As the gas does not dissolve, it rises to the top of the gas jar and **displaces** the denser water out of the jar.
- e.g. H_2, O_2, CO_2, **NH_3 is not suitable**

upward delivery



- For gases that are …… than air (use Mr to determine)

downward delivery



- For gases that are …… than air (use Mr to determine)

solubility of gases

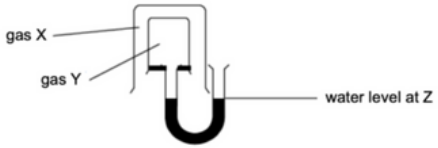
H_2	most insoluble
O_2	
CO_2	
NH_3	most soluble

porous pot (diffusion)

A porous pot is typically a container made of a porous material, such as unglazed ceramic, which allows the passage of gases or liquids through its tiny holes in both directions

- gas from the interior of the pot can escape to the surroundings
- gas from the surroundings can permeate inward into the pot
- The movement of the water level inside the pot depends on which gas diffuses faster.
  - The gas with the lower molar mass (Mr) diffuses faster

The set–up below shows how the relative rate of diffusion of gas X and Y can be determined.



The water level at Z increases. Which of the following could be gas X and gas Y?

	X	Y
A	carbon monoxide	carbon dioxide
B	ethene, C_2H_4	nitrogen
C	carbon dioxide	oxygen
D	sulfur dioxide	ammonia

ESS/2023/Prelim/Q3 (Adapted)