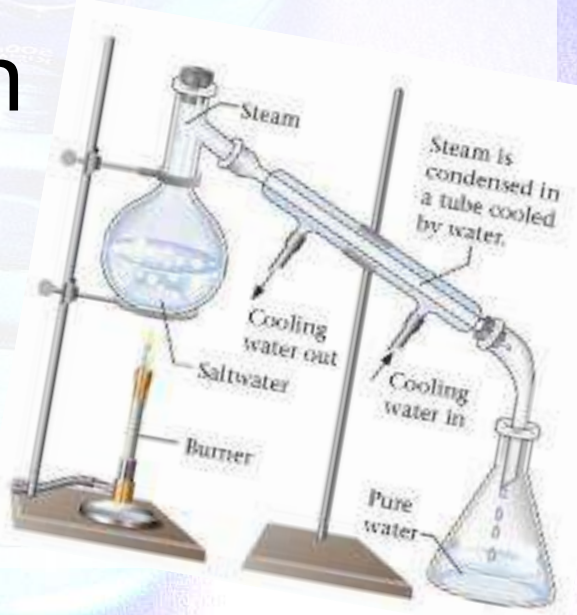
Matter

Separation of Mixtures

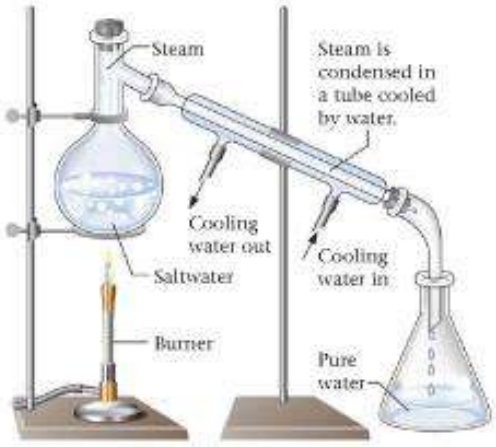
Separation of Mixtures

- Most of the matter found in nature is a mixture of pure substances.
- One method of separating mixtures is called distillation.
- **Distillation** → a separation process that depends on the different boiling points of the substances.



Separation of Mixtures

- Water is separated from the minerals by boiling, which changes the water to steam (gaseous water) and leaves the minerals behind as solids.
- If we collect and cool the steam, it condenses to pure water.



Separation of Mixtures

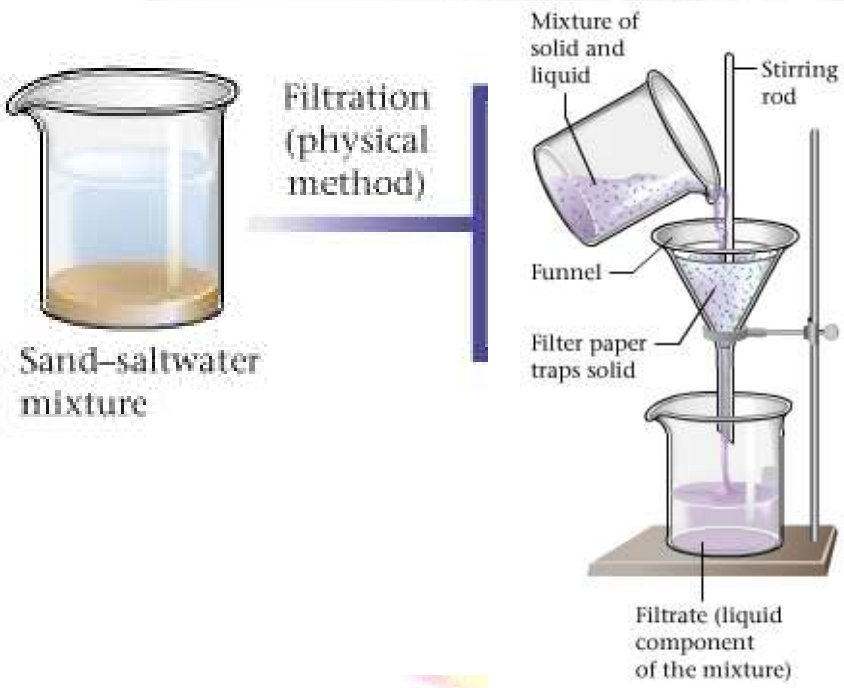
- In distillation, the change of water from a liquid to a gas and then back to a liquid are examples of changes of state.
- Changes of state are examples of physical changes and do not change the composition of the individual substances.

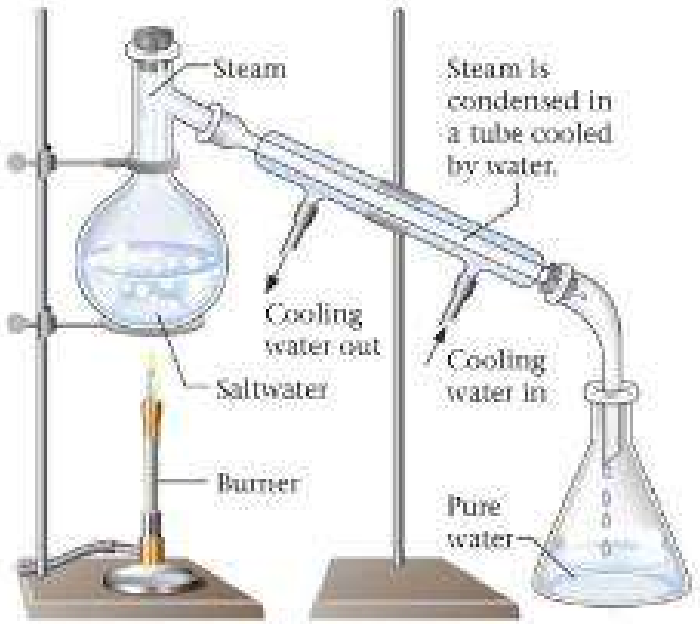
Separation of Mixtures

- A second method of separating mixtures is called filtration.
- **Filtration** → separation of a solid from a liquid by using filter paper.
  - Pour the mixture onto a mesh (or filter paper), which allows the liquid to pass through and leaves the solid behind.

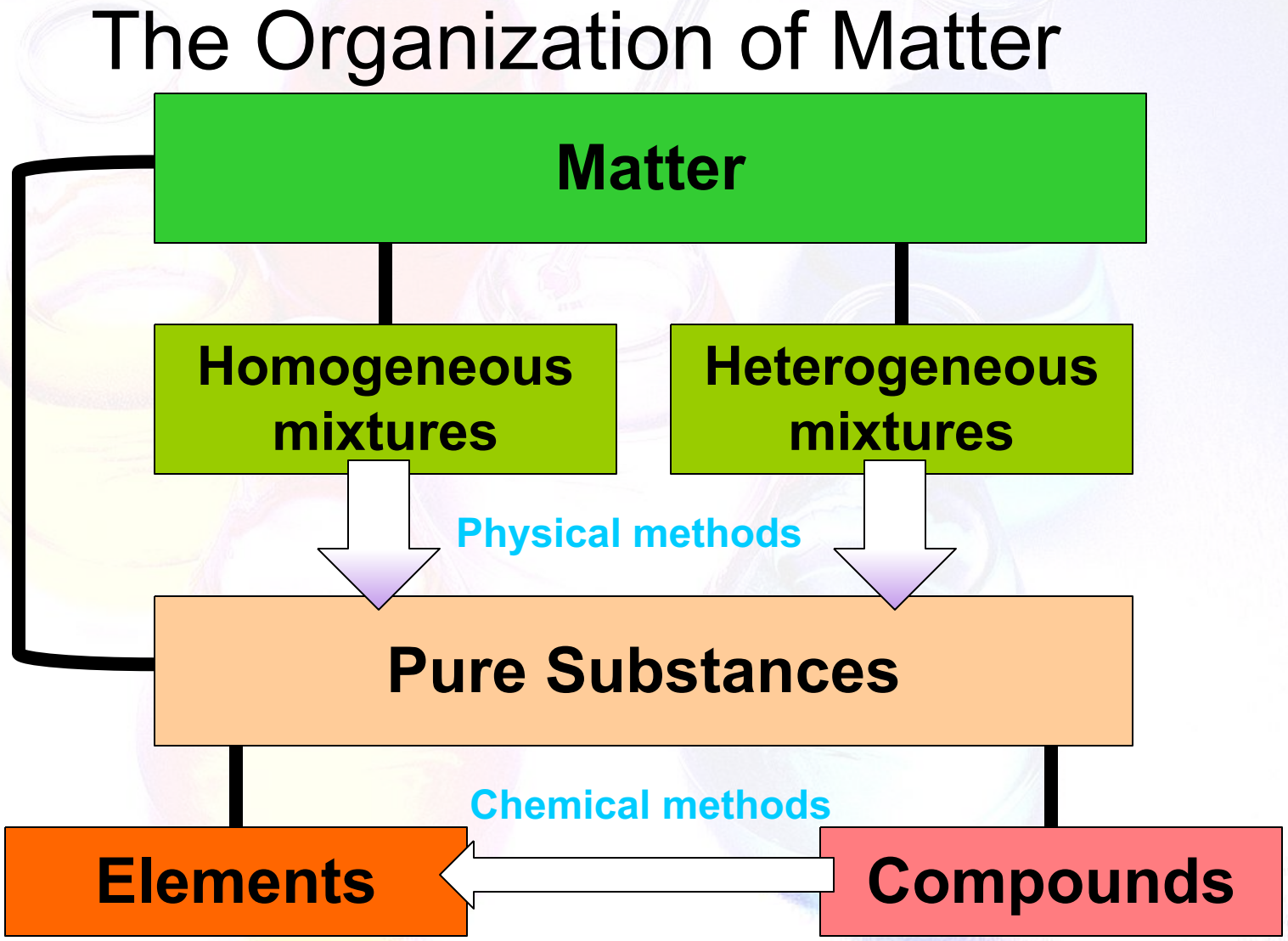
Separation of Mixtures

- A mixture may require multiple methods of separation before the pure substances are extracted.





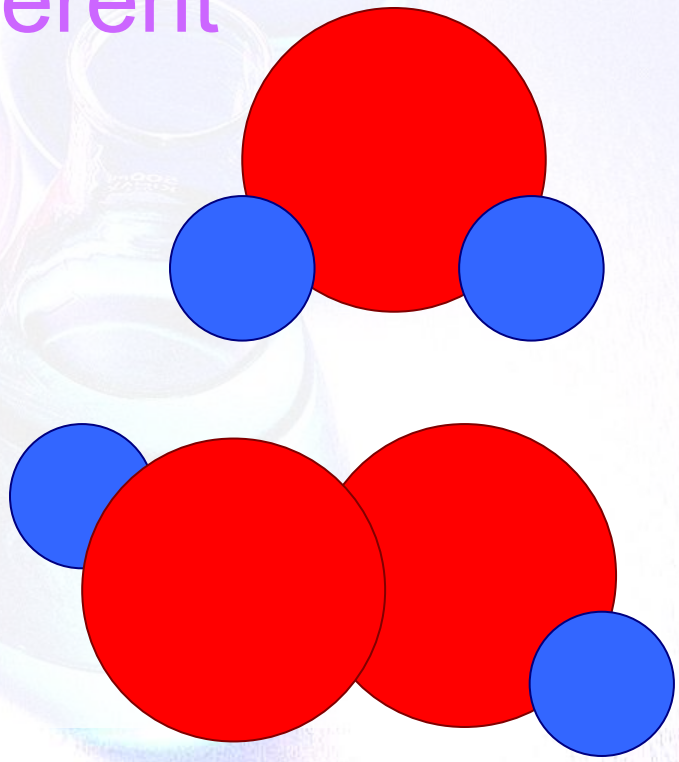
Separation of Mixtures



Separation of Mixtures

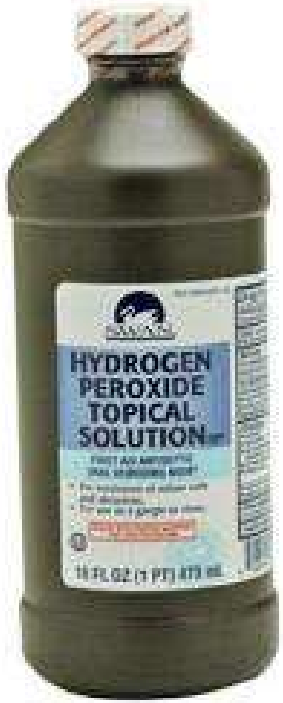
Celebrity Chemical: Hydrogen Peroxide (H_2O_2)

- Hydrogen and oxygen atoms can combine to form two different molecules:
  - Water H_2O
  - Hydrogen peroxide H_2O_2
- Their Properties are very different!



Separation of Mixtures

- Hydrogen peroxide is a corrosive liquid.
- It would poison us if we drank it!
- Commonly used as a bleaching agent for hair, fibers, flour, teeth, and bones.
  - Reacts with melanin in hair, causing it to lose its brown or black color, turning brown hair blonde.
  - A whitening agent in toothpastes.
- Used for its *antiseptic* (kills microorganisms) properties to prevent infection in cuts.



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