Section 2.3

Changes of Matter

EQ: Why is getting a haircut an example of a physical change?

§ 2.3: CHANGES OF MATTER

• Physical Changes:
  – Affects one or more physical properties of a substance without changing the identity of the substance.
  – Ex: dissolving, phases changes (freezing, melting, condensing, vaporizing, subliming), cutting hair, sanding a piece of wood, mixing oil and water
  – Most changes can be reversed (just don’t tear the paper!)

EQ: Why is baking bread an example of a physical change?

PHYSICAL AND CHEMICAL CHANGES

• Chemical Changes:
  – When one or more substances are changed into entirely new substances that have different properties.
  – Ex: Burning, using batteries, respiration, photosynthesis, growing plants, food being digested, rust forming
  – Chemical reaction cannot be reversed by physical changes.
PHYSICAL AND CHEMICAL CHANGES

• Chemical Changes can be detected:
  – Evidence of a Chemical Reaction:
    • Color changes
    • Gas is produced
    • Solid forms (aka. A precipitate)
    • Energy released

EQ: Why is baking bread an example of a physical change?

SEPARATION TECHNIQUES

• Elements: Cannot be broken down
• Compounds:
  – Can be broken down through chemical reactions
    (i.e. using electric current to separate hydrogen from oxygen in H₂O)
• Mixtures
  – Separated by physical means (i.e. filtration, distillation)

EQ: How can mixtures and compounds be broken down?

SEPARATION TECHNIQUES

• Filtration: Separated by particle size.

EQ: How can mixtures and compounds be broken down?
**EQ: How can mixtures and compounds be broken down?**

**SEPARATION TECHNIQUES**

- **Distillation:** Separation by boiling points

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**EQ: How can mixtures and compounds be broken down?**

**SEPARATION TECHNIQUES**

- Pretend that you are given a mixture from the ocean. It contains water (with salt obviously), sand, and seashells. You need to separate all four components.
  a. What substance would you separate first? How would you do it?
  b. What substance would you separate next? How would you do it?
  c. How would you separate the final two substances?