

What Are Elements, Compounds and Mixtures?

Worksheet

Elements are pure substances containing only one type of atom. Compounds are pure substances formed when elements bond chemically. Mixtures are two or more substances physically blended - they are not chemically bonded.

Questions

1. Which is a pure substance?

- A) Salt water
- B) Oxygen gas (O)
- C) Sand and gravel
- D) Soil

2. Rusting iron (iron oxide, FeO) is a(n)

- A) Element
- B) Mixture
- C) Compound
- D) Suspension

3. How do you separate salt from salt water?

- A) Use a chemical reaction
- B) Evaporate the water
- C) Burn it
- D) Freeze it

4. Which can be separated by filtration?

- A) Pure water
- B) Hydrogen gas
- C) Sand in water
- D) Table salt

5. Pure water (H₂O) is a compound. Name the elements it contains.

6. Salt water is a mixture. Name the compound and the element/solvent.

7. Air at sea level contains ~78% nitrogen gas (N₂) and 21% oxygen (O₂). Is it an element, compound, or mixture?

8. Define: What is an element?

9. Define: What is a compound?

10. Define: What is a mixture?

Answer Key

1. B) Oxygen gas (O) - Oxygen gas is an element (pure substance). Salt water, sand+gravel, and soil are all mixtures.
2. C) Compound - Iron oxide forms when iron and oxygen atoms bond chemically - it's a compound.
3. B) Evaporate the water - Salt and water are physically mixed. Boiling off the water leaves the salt.
4. C) Sand in water - Sand is insoluble and can be filtered out. Pure substances cannot be separated physically.
5. Water is made of hydrogen and oxygen atoms bonded together. Elements: Hydrogen (H) and Oxygen (O)
6. Salt water = salt (NaCl, a compound) + water (H₂O, a compound) The solvent is water; the solute is salt.
7. Air contains two different gases (N and O) physically mixed. Air is a mixture.
8. A pure substance made of only one type of atom; cannot be broken down by physical means.
9. A pure substance formed when two or more elements bond chemically in a fixed ratio.
10. Two or more substances physically combined; can be separated by physical methods.

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