

Chapter 1 Matter and Energy

Learning Objectives

Introduction

- Relate the experiences described in the introduction to experiences you encounter around your campus. Consider ways in which you might classify them.

1.1 Matter and Its Classification

- Describe characteristics that distinguish different types of matter.
- Describe how mass (Measurement of quantity of matter) is related to matter.
- Classify matter by distinguishing among pure substances, mixtures, elements, compounds, homogeneous mixtures, and heterogeneous mixtures.

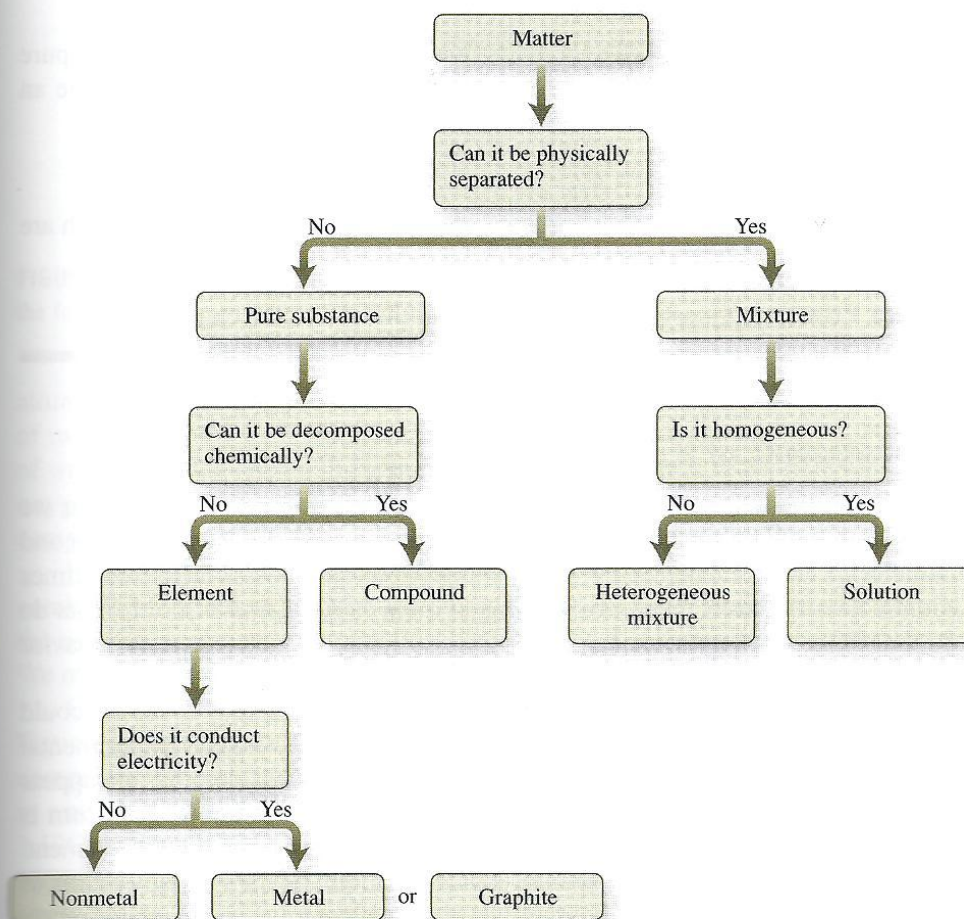


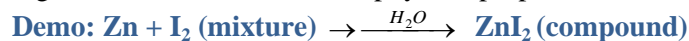
FIGURE 1.7 We can classify matter by answering the short series of questions in this flowchart.

- Use element symbols as a shorthand notation to represent the elements.
- P. 6 and 7 Ex. 1.1, 2 Have **examples of Fe, Cu, S, Mg (Show K** in water (Practice Problem 1.2)
 P.10, Ex. 1.3, Practice Problem 1.3

- Distinguish between elements, compounds, and mixtures using molecular-level representations.
- Distinguish between atoms and molecules.
 Ex. Chlorine = $\text{Cl}_{2(g)}$, Ethanol = $\text{C}_2\text{H}_5\text{OH}_{(l)}$, Table Salt = $\text{NaCl}_{(s)}$
- Characterize the various states of matter in terms of shape, volume, and structural organization.
- Distinguish between solids, liquids, and gases.
- Distinguish aqueous solutions from liquids.
Demonstrate liquid water. Dissolve salt in water to show aqueous.
- Use symbols – (s), (l), (g), (aq) – to represent various physical states.

1.2 Physical and Chemical Changes and Properties of Matter

- Describe some properties of matter
- Describe various types of physical properties.
- Explain how mass is measured.
- Know symbols and prefixes for metric units.
- Explain how volume is measured for liquids and variously shaped objects.
- Express quantities in various units and convert between units.
- Give examples of physical changes.
- Describe substances can change into different physical states and how these states differ at the molecular level.
- Distinguish between chemical changes (reactions) and chemical properties.
- Distinguish between chemical and physical properties and chemical and physical changes.



Homework Problems:

P. 45 #1,2, 23-30, 42, 45-52, 58-62, 70, 71, 86-98