

# Chapter 1

## Introduction

### Overview

The periodic table lists all elements in a systematic fashion, so that elements with similar characteristics appear underneath each other. Different types or classes of materials can also be correlated with the positions of the corresponding atoms, or combinations of atoms, in the periodic table. We will enumerate and discuss briefly some of the main properties of the major classes of materials: metals, ceramics, inorganic glasses, polymers, and semiconductors.

**After studying this chapter, you will be able to :**

1. Recognize the systematic pattern of how the elements are displayed in the periodic table;
2. Locate the main groups of materials (metal, non-metals, semi-conductors) in the periodic table;
3. Identify the major classes of materials (metals, ceramics, inorganic glasses, polymers, semiconductors);
4. Associate these classes of materials with their constituent elements;
5. Distinguish these classes of materials in terms of a few of their important properties (mechanical strength, ductility, electrical conductivity, structure).