

## The Periodic Table

### 1. The Periodic Table

#### 1.a. Physical Properties

1.a.1 Color, mass, smell, boiling point, melting point, freezing point, density, electrical conductivity, atomic configuration.

#### 1.a. Atomic Structure

1.a.1.1 Nucleus is composed of protons and neutrons.

1.a.1.1.1 Protons have a mass of 1 unit, and a positive electrical charge.

1.a.1.1.2 Neutrons have a mass of 1 unit, and an overall net electrical charge.

1.a.1.1.3 Electrons have a mass of  $\sim 1/2000$  of 1 unit, and have a negative electrical charge.

1.a.1.1.4 Electrons exist in probability clouds around the nucleus.

1.a.1.1.5 Valence electrons are the electrons in the outermost "orbital."

#### 1.a.1. Atomic History...

1.a.1.1.1 Mendeleev arranged elements based on atomic mass, there were gaps in his table and Mendeleev thought that these would be new elements found in the future.

1.a.1.1.2 Moseley (just after Mendeleev) arranged the periodic table based on atomic number (the number of protons in the nucleus of the atom).

1.a.1.1.2.1 Atomic number: the number of protons in the nucleus of the atom.

1.a.1.1.2.2 Mass number: the sum of the protons and neutrons together.

1.a.1.1.2.3 Atomic mass: the mass of an atom in relation to the mass of carbon.

1.a.1.1.2.4 Relative atomic mass figure: the mass as a mixture of isotopes, the average mass.

1.a.1.1.2.5 Isotopes are elements with the same atomic number and different mass numbers.

#### 1.a. Periods

1.a.1.1.1 Rows in the periodic table

1.a.1.1.2 Rows represent how many electrons "orbitals" an element has.

1.a.1.1.3 The first period has one "orbital," the second period has two "orbitals..."

#### 1.a. Groups

1.a.1.1.4 Columns in the periodic table