

Atomic Structure – Study Guide

Grade 8 – Physical Science

Atom -- smallest particle of an element that has all the properties of that element.

3 main subatomic particles:

1. protons
2. neutrons
3. electrons



nucleus -- core of the atom, it is positively charged. 99.9 % of the atom's mass is in the nucleus. Protons and neutrons are found in the **nucleus**.

1. Protons -- have a positive (+) charge. Found in the nucleus of the atom.

The **number of protons** determines what element an atom is.

Example: Carbon has 6 protons

Atomic Number = the **number of protons**, each element has its own unique number of protons.

2. Neutrons -- a neutral charge (no charge) found in the nucleus. These determine whether an element is radioactive.

Protons and neutrons are about *one atomic mass unit (amu)*. Electrons have a much smaller mass -- it takes almost 2000 electrons to equal 1 amu.

Atomic Mass = the total number of protons and neutrons.

Mass Number = Atomic Mass that is rounded.

To find just how many **neutrons** an atom has:

neutrons = atomic mass – atomic

Isotopes - atoms of the same element that have different number of neutrons.

Carbon-12

6 protons

6 neutrons

Carbon-14

6 protons

8 neutrons

NOTICE – the number of **protons DOES NOT** change if it is to be carbon -- only the number of neutrons.

3. Electrons - have a negative (-) charge. Found moving around the atom in a space called orbital's (shells).

Those electrons farthest away from the nucleus are called **valence electrons**, and are involved in the formation of chemical bonds.

In an uncharged atom the number of protons is equal to the number of electrons.

ion - when an atom gains or loses an *electron* (has a charge)

If an atom gains electrons = negative (-) charge

If an atom loses electrons = positive (+) charge

How to find:

protons = atomic

neutrons = atomic mass – atomic

electrons = atomic # – charge (if any)

Matter And Atomic Structure Study Guide Answers

AW Rasmussen



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