3.3 Distinguishing Among Atoms

I. Atomic Number, Mass Number, and Isotopes

A. Atomic Number (Z)- The number of protons in the nucleus of each atom of that element

1. Atoms are identified by their atomic number.

2. Because atoms are neutral, # protons = # electrons

3. Periodic Table is in order of increasing atomic number.

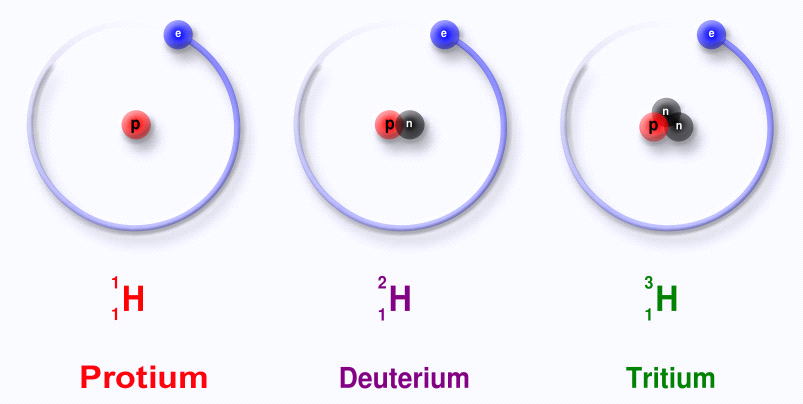
B. Mass Number- The total number of protons and neutrons in the nucleus of an isotope

C. Isotopes- Atoms of the same element that have different masses

1. All atoms of the same element have the same # of protons, but may vary in the number of neutrons.

2. Although isotopes have different masses, they do not differ significantly in their chemical behavior

3. Hydrogen as an example:



D. Designating Isotopes

1. Hyphen notation - Mass number is written after the name of the element or chemical symbol

(a) hydrogen-2, helium-4

(b) H-2, He-4

2. Nuclear Symbol - Composition of the nucleus using the element's symbol

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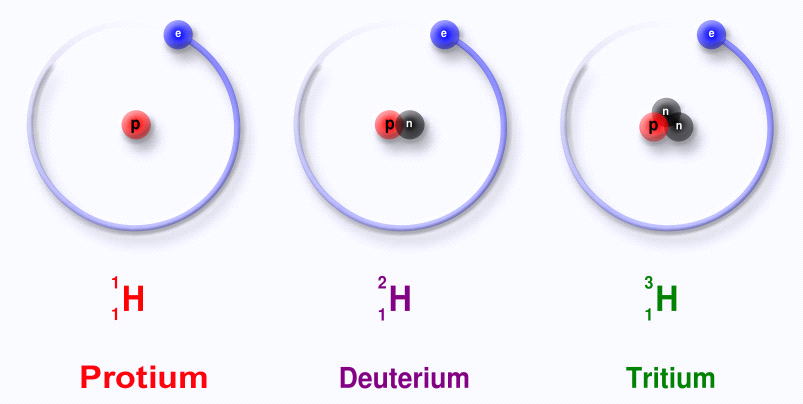
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