Thinking About Atomic Mass and Density

Every element has a different number of protons. Scientists have given each element a number based on the number of protons in an atom of that element. This number is called an atomic number. Each element's atomic number is unique. The higher the atomic number, the more protons an element has. So for example, hydrogen has one proton and an atomic number of 1, while uranium has 92 protons and an atomic number of, you guessed it, 92.

All atomic particles are measured in atomic mass units (amu) because they are too small to measure using grams. The mass of a proton and a neutron are both approximately 1 amu. However, the mass of an electron is much smaller, approximately 1/1836 that of a proton or a neutron. Therefore, when measuring the mass of an atom, only the mass of protons and neutrons are used. To find the mass of an atom, scientists add the mass of the protons and neutrons of that particular atom. For example, if an atom had 11 protons and 12 neutrons, its atomic mass would be 23 amu.

Each element has a mass number, which is equal to the element's atomic mass. In other words, the mass number is equal to the number of protons and neutrons in one atom of that element. Knowing the atomic number (or the number of protons) and the mass number (or the number of protons plus the number of neutrons), one can find the number of neutrons an element has. For example, if an atom has an atomic number of 79 and a mass number of 197, the number of neutrons in this atom is 118, or:

(protons + neutrons) - protons = neutrons

197 - 79 = 118.

Using the atomic number and mass number of elements in the periodic table, one can figure out the number of protons, electrons and neutrons of an element.