

# Rare Isotope Science Project

There are many atoms from Hydrogen to Livermorium(116). But in the nature, the largest atom is Uranium(92). From Neptunium(93), large and heavy atoms should be made artificial, combining two atoms, and going larger and heavier, the atom cannot stand longer and easily broken(fission).

This is same as neutron, in isotopes. When the number of neutron is much less or more than proton in a atom, the atom is easily broken also.

The fusion, fission processes which explain the fusion of two atoms and the fission of heavy atom are used, and have some relations between the number of proton, neutron and the mechanism.

There is not only periodic table which lists the atoms by the number of proton, but also a table of nuclides which lists all of atoms from heavy atom to isotopes related to the number of protons and neutrons. When looking the table of nuclides, interesting things can be found that there are a states which the atom is (relatively) stable at the specific numbers of protons and neturons, called Magic Number. These numbers can be derived by using specific potential well, with spherical harmonic oscillators and the spin-orbit coupling.

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