NUCLEAR ALCHEMY

The alchemy of Medieval times evolved over many hundreds of years into the chemistry of modern times. Ancient alchemy was similar to modern chemistry in that the alchemist reacted chemicals together in vessels and studied the results. But alchemy was substantially different from modern chemistry in the alchemist was concerned with more than the material aspect of the chemical reactions. Lacking a periodic chart of the elements, something that was not developed until the 18^{th} and 19^{th} centuries, alchemists focused their attention on the subtle aspects of the chemical reaction. They believed that all chemicals and chemical reactions had a substance called "essence" that the alchemist interacted with at the time the chemicals were synthesized.

As the alchemist reacted ionic salts and metals together, the subtle processes of the reaction stored essence in the resultant compounds. The final product and goal was to produce the philosophers stone, and stone that contained the essence of the alchemist. This stone then allowed the alchemist to see and understand things not previously understood, either by him or other alchemists or other people.

The science of nuclear alchemy is the study of the relationship between nuclear transmutation reactions and chemical reactions. Nuclear alchemy was discovered a few years ago by the researchers working on cold fusion. In a particular category of cold fusion reactions, excess heat is produced in a unit that is filled with lithium-deuterium-hydroxide (LiOD) in water. The apparent chemical nature of the reaction led the researchers to the conclusion that the excess heat from the apparent cold fusion (nuclear) reaction must have been assisted by unknown chemical processes and reactions. The term "chemically assisted nuclear reactions (CANR)" was coined to describe these processes.

As is the case with the existing chemical and atomic sciences, nuclear alchemy also requires the construction of organizational charts of the elements. These charts will be different from the existing Periodic Chart of the Elements in that elements are listed by their isotopes instead of by their valence or free electron number. The charts will be substantially different from the existing chemistry in that its structure will reflect the dynamic process of nuclear transmutation, where one element is transformed into another through nuclear processes and reactions. In the existing chart, the listing of elements by valence does not ascribe any dynamic qualities to them.

Nuclear alchemy seeks to understand the processes that control the transmutation of elements. On the nuclear level, it seeks to understand the processes of fission and fusion. On the atomic and molecular level, it seeks to understand the manner in which molecules and assembled and the manner in which they function. At both levels, it is the dynamics of the process that is the main concern, not the description of static forms of matter.

Nuclear alchemical processes are defined and described in terms of sequences of elemental isotopes, stable and unstable. On the nuclear level, these sequences are arranged such that they will describe transmutation. On the molecular level, they are arranged such that they will describe the form and function of molecules. Large biological molecules and molecular complexes, found in living things are included in this type of alchemical process.

Nuclear alchemy will include its own litany of new terms, all necessary to describe nuclear transmutation. Among them will be the following:

1. The “O” or “orbit” neutron, a neutron that orbits between adjacent nuclei, never settling completely into either.

2. The “RBD” neutron, a neutron that is produced by reversed beta decay (RBD), where an electron and a neutrino are added to a proton to produce a neutron. This is a reverse process of the beta decay, where a neutron decays into a proton, an electron, and a neutrino: $n = p + e + v$.

3. The “p/n” number of an element. This is the number of protons (p) and neutrons (n) in the nucleus of the particular isotope.

4. A “fundamental isotope” is one that, when paired with its “mirror symmetric” opposite, make a “fundamental pair.” “T(1,2)/He3(2,1)” is a fundamental pair in mirror symmetry. Tritium, with one proton and two neutrons, is mirror symmetric to Helium-3, with two protons and one neutron.

5. A “parent isotope” is one that is produced from the tri-symmetry of fundamental isotopes. They will be explained in greater detail when they are considered.

CHARTS

The Mendeleev Chart of the Elements is the organizational basis of modern chemistry. Although the chart was devised by physicists studying the properties of atoms, it has gained its widest use amongst chemists, this because it organizes elements according to their valence numbers. Nuclear alchemy has its own charts, but instead of listing elements by valence, it lists them according to isotopic weight, the previously defined “p/n” numbers. The first of these (shown below) lists the isotopes of the first eight atomic elements, beginning with hydrogen and ending with oxygen. Not all of these are commonly occurring isotopes, but they are listed because they are essential to the science of nuclear alchemy.

Chart 1: Isotopes of H through O

P/n numbers	Elements
(1,0) (1,1) (1,2)*	H D T
(2,1)* (2,2) (2,3)*	He3 He4 He5
(3,2)* (3,3) (3,4)	Li5 Li6 Li7
(4,3)* (4,4)* (4,5)	Be7 B38 Be9
(5,4)* (5,5) (5,6)	B9 B10 B11
(6,5)* (6,6) (6,7)	C11 C12 C13
(7,6)* (7,7) (7,8)	N13 N14 N15
(8,6)* (8,7)* (8,8) (8,9) (8,10)	O14 O15 O16 O17 O18

* isotope that is unstable under normal conditions

Fundamental Isotopes and Parent Isotopes

The basic or fundamental nuclear-alchemical reaction involves the transmutation of fundamental isotopes into parent isotopes. In each case where a fundamental pair is transmuted into a parent pair, the new parent pair becomes the fundamental pair for the generation of the next parent pair, which becomes the new fundamental pair for the..., and so on.

The "p/n" numbers of fundamental isotopic pairs interact in "tri-symmetry" to generate parent isotopic pairs according to:

$$P_1 = N_1 + 2N_2 \quad P_2 = N_2 + 2N_1 \quad N = (p,n) \qquad ; \qquad .$$

Where: N_1 and N_2 - "p/n" numbers of fundamental elements.
P_1 and P_2 - "p/n" numbers of parent pair.

Example 1: Generate a parent pair of isotopes from the fundamental pair of elements, "X" and "Y."

Let: X = T(1,2)
Y = He3 (2,1)
N_1 = (p/n) for element X;
N_2 = (p/n) for element Y.
P_1 = (p/n) for first parent element to X and Y.
P_2 = (p/n) for second parent element to X and Y.

Therefore: P_1 = (1,2) + 2(2,1) = (5,4) = B9*
P_2 = 2(1,2) + (2,1) = (4,5) = Be9

In this example, the "T/He3" elemental pair generates the "Be9/B9" parent pair.

Example 2:

Let: X = He(2,3); Y = Li(3,2).

And: P_1 = (8,7) = O15
P_2 = (7,8) = N15

In the example, the helium-lithium pair generates a nitrogen oxygen pair. He5 and Li5 are unstable under ordinary conditions, however when they act together in a specially created environment, a "non-ordinary" condition is created, and they can be stabilized indefinitely. The stability of this elemental pair is a product of their joint action, where their combination is made possible by the reaction environment.

Chart 2 describes the fundamental/parent isotopic reactions for the light elements (up to oxygen). The fundamental (initial) reacting pair is listed to the left, and the resultant, parent pair is listed to the right.

Chart 2: Elemental Pairs

1. T*/He3* (1,2)/(2,1) ➜ 3. Be9/B9* (4,5)/(5,4)
2. He5*/Li5* (2,3)/(3,2) ➜ 4. N15/O15* (7,8)/(8,7)

➜ 5. Al27/Si27* (13,14)/(14,13)
➜ 6. Ti45*/V45* (22,23)/(23/22); Ti45 ➜ Sc45

In the chart, reaction No. 1 produces reaction No. 3; No.3 produces No. 5; No. 2 produces No. 4; No. 4 produces No. 6. The parent pairs, Nos. 3, 4, and 5, have one stable and one unstable isotope. Theoretically, it is possible for the fundamental reactions listed in Chart 2 to go on through all of the known elements. However, if this happens the resulting heavy isotopes will be deficient in neutrons. This problem shows up in the last reaction in Chart 2 (No. 6), which yields no stable isotopes. In the case of the most stable isotope generated (Ti45), it is possible for it to undergo RBD and convert to a neutron, in which case it will be transmuted into the stable isotope of scandium, Sc45. For the generation of isotopes beyond reaction No. 6, a new series of isotopic reactions must be defined, those based on reactions between fundamental pairs and a special form of the first fundamental pair, the "trimer."

Isotopic Trimers

One of the basic postulates of nuclear structure is that an element's neutron number rises exponentially as its proton number rises linearly. The heaviest element that exhibits nuclear parity, where its proton and neutron numbers are equal, is the stable isotope of calcium, with 20 protons and 20 neutrons. Beyond this element, all stable isotopes have more neutrons than protons in their nuclei.

Excess neutrons are added to the parent isotopes undergoing nuclear transmutation by the isotopic trimer. There are two trimers. Both are a product of tri-symmetric reactions between fundamental pairs:

1. 3[T(1,2)] = (3,6) = Li9
2. 3[He5(2,3)] = (6,9) = C15

Trimer isotopes are unstable, with short lifetimes, however, they interact immediately with the parent isotopes from the previously described isotopic reactions. Because they are neutron heavy, trimers easily transmute into elements with lower atomic numbers through neutron decay. Their main function, however, is to add extra neutrons to light isotopes so that when they transmute into heavy isotopes they will enough neutrons to become stable. Every time a trimer is added to a light isotope, there is either a two-to-one increase in neutrons over protons (for the T/He3 trimer), or a three-to-two increase (for the He5/Li5 trimer).