White Paper

SYNTHESTECH

COLD TRANSMUTATION OF CHEMICAL ELEMENTS
TECHNOLOGY OF SYNTHESIS OF PRECIOUS METALS

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INTRODUCTION

Nowadays, there is a huge demand for a number of valuable chemical elements like palladium, ruthenium, rhodium, osmium, iridium, platinum and some others. The demand for isotopes (varieties) of chemical elements has also arisen over the past decades.

Valuable elements and isotopes have characteristics that are in demand in many modern industries (microelectronics, transport, energy storage) and also have special properties in treatment of diseases.

However, there are some significant factors limiting the supply of valuable elements and isotopes, since they are not widely spread in nature. The traditional way of obtaining valuable elements, which is extraction of such elements from natural deposits, is no longer able to keep up with the growing demand.

Modern nuclear technologies are the so-called high-energy nuclear reactions that can create valuable elements and isotopes by means of nuclear transformations, but they are incredibly expensive and lead to environmental disasters and the results are unstable. Therefore, the only industry where the splitting of atom is used today is power engineering.

At the same time, since ancient times mankind is working on another method of obtaining valuable elements and isotopes - Low-Energy Nuclear Reactions (LENR). It is a transformation (transmutation) of certain chemical elements into others in their natural environment, without using enormous amounts of energy for the atom splitting.

The last period of the 20th century and the beginning of the 21st witnessed a huge breakthrough in such technologies. First, practical proofs of LENR reactions in power engineering were collected, then a homemade low-energy nuclear reactor that generates electricity was built, facts of nuclear reactions taking place in nature, were systematized and studied, and results of biological nuclear reactions using bacteria were obtained.

Today the time has come to take the next step - to master the technology for turning cheap elements into valuable elements and isotopes by means of low-energy nuclear reactions.

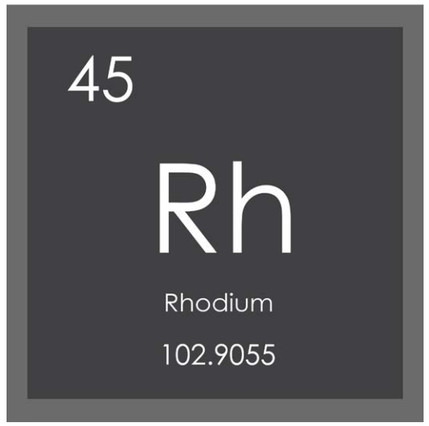
CONTENTS

SCIENTIFIC FUNDAMENTALS

Valuable elements are elements that meet any of the following characteristics:

- do not undergo natural oxidation and/or decomposition;
- are resistant to aggressive environment;
- have a number of rare properties;
- are scarce in Nature and expensive in terms of extraction.

Such elements include, for example, platinum, palladium, rhenium, rhodium, iridium, osmium, gold and a number of other elements. These elements are in demand in industry, energy and medicine, due to these characteristics. The demand for valuable elements is constantly growing.

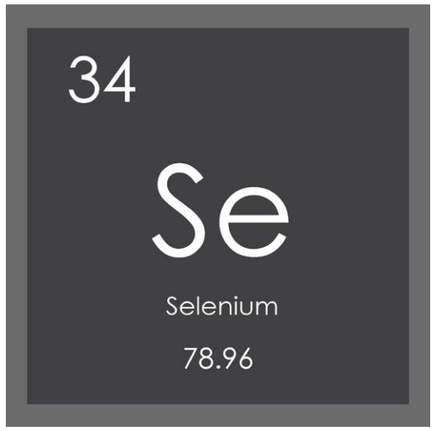


Example: Rhodium

World production of rhodium is 3 tons per year. Attempts to expand usage of metal caused a sharp jump in prices in 2008 up to $10,000 per troy ounce (31.1 grams). It is almost impossible to increase its production. In this regard, the expansion of its application again will cause an incredible price jump which makes the usage unprofitable.

In addition to the demand for chemical elements, there is a great demand for their isotopes. Isotopes are types of chemical elements in which an atom differs from another atom of the same element by the number of neutrons in the nucleus and, correspondingly, by atomic weight.

An extracted isotope of a chemical element can have its unique properties unlike other isotopes of the same element and a mixture of its isotopes. At the same time, there are natural and artificially obtained isotopes. The demand for isotopes in industry and medicine appeared in the second half of the 20th century.



Example: Selenium-74

Selenium-74 is a natural isotope extracted from a natural mixture. The cost of isotopes of chemical elements is significantly different from their cost in a mixture with others. For example, plain selenium costs $38 per kilogram and its isotope extracted from the natural mixture - selenium-74 - costs $20,000 per gram, which makes it an especially valuable isotope. Due to selenium-74, a high-power ultraviolet plasma laser was created. This isotope can also be used in many other ways.

TECHNOLOGIES

Present technologies for obtaining valuable elements and isotopes

Extraction from natural deposits

Very often in nature there is no needed concentration of valuable elements, sufficient for economically profitable extraction. Especially it concerns platinum-group metals. For example, a number of platinum elements can be obtained as by-products in processing/refining of copper-nickel ores. The production of platinum metals is a result of multistage and complex purification, using chemical reagents and calcination. This is the most widely used industrial technology for obtaining valuable elements. The world leaders in production are South Africa and Canada.

High-energy nuclear reactions

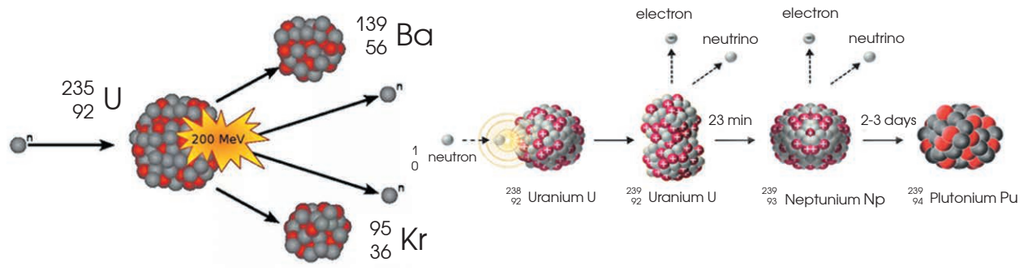
High-energy nuclear reactions - are a technology used by the nuclear industry based on high-energy splitting of atoms. In essence, a target is bombarded by a beam of charged particles accelerated by electric and magnetic fields. Such impact results in nuclear transmutation in the targeted chemical element with emission of radioactive radiation and conversion of one element (its isotope) into another element (isotope). John Cockroft and Ernst Walton in 1951 received the Nobel Prize in Physics for their pioneer work on "Transmutation of atomic nuclei by artificially accelerated atomic particles».

However, this method's applicability is significantly limited due to the high cost that starts from $10,000 per gram of a product and reaches tens of millions of dollars.

Separation of isotopes

Ever since differences in the isotope properties of chemical elements were discovered, the problem of their separation arose. Different methods of separation are used for different elements, but the most well-known method is gas centrifugation. Cascades of gas centrifuges separate isotopes into light and heavier ones. Exactly this method is used in uranium enrichment, allowing to use it in nuclear power engineering and creation of nuclear weapon. There are other methods, such as laser separation, separation with an accelerator, etc. For some isotopes, chemical enrichment is possible, which is based on difference in the speed of chemical reactions between heavy and light isotopes of a substance.

NUCLEAR REACTIONS



Picture 1. A classic example of high-energy transmutation is the transformation of uranium into plutonium.

Humankind has always sought to obtain valuable elements from low-value ones or widespread elements, in other words, to carry out transmutation of chemical elements.

Nuclear reactions or transmutation in physics is a transformation of some chemical elements (or isotopes) into others. In the same sense, terms such as nuclear fusion, nuclear transformations, transmutation of elements or nuclei are also applicable.

Bombarded by accelerated charged particles, uranium nuclei are destroyed and undergo some kind of radioactive decay: Alpha decay, Beta decay, Electron capture, etc. Radioactive decay leads to transmutation - formation of neptunium atoms and isotopes from uranium atoms and isotopes. In fact, this impact method causes direct destruction of the original atoms and is accompanied by ionizing radiation.

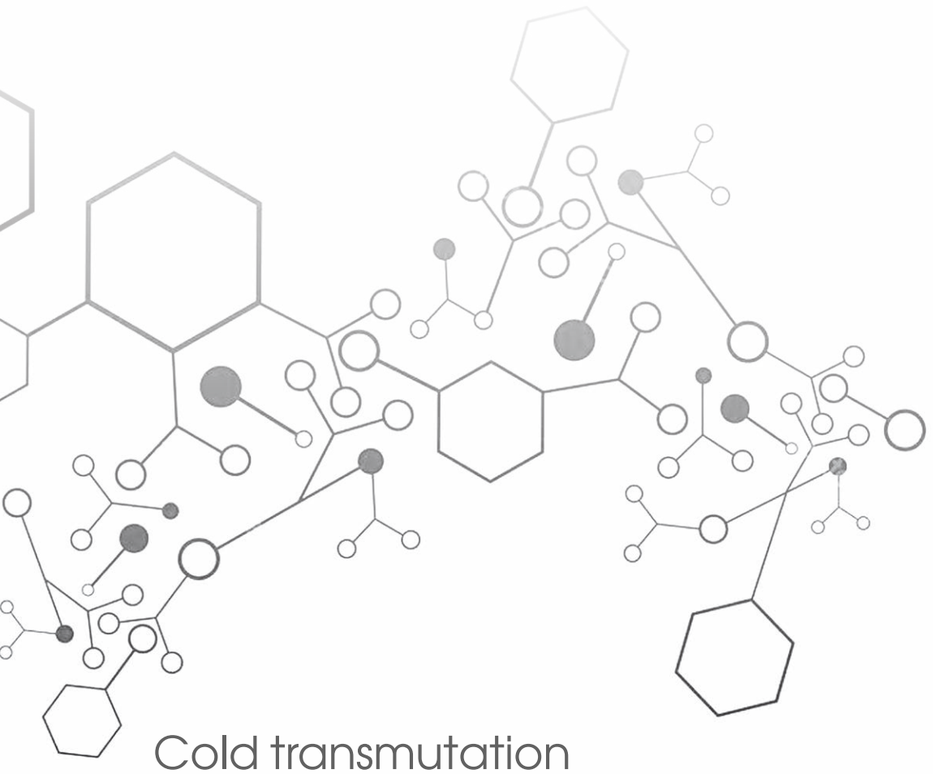
Example of conversion of mercury into gold by high-energy impact

In the 20th century mankind in scientific studies reached the nucleus of elements and transmutation received official recognition. In 1941 A. Sherr and K.T. Bainbridge, Harvard University, transported accelerated deuterons to the lithium target and thereby obtained a fast neutron flux that was used to bombard mercury nuclei. Transmutation of mercury into gold was carried out according to the following equation:

$$^{196}\mathbf{Hg} + n = ^{197}\mathbf{Hg} \xrightarrow{64\ \text{hours},\ \text{e-capture}} ^{197}\mathbf{Au}$$

In fact, the experiment results showed that only 0.15% of mercury transforms into stable gold according to this equation. The obtained gold isotopes with mass numbers 198, 199 and 200 were not stable, unlike the gold-197 which is known in nature. Emitting radioactive radiation, they decayed and turned back into stable mercury isotopes with isotopic numbers 198, 199 and 200. This happens because mercury isotope -196 constitutes only 0.15% of the total mercury content and, when bombarded, can yield stable gold-197.

As a result of the nuclear transformation, gold was received, a tiny exhibit of which adorns the Chicago Museum of Science and Industry. But operation of the reactor and, accordingly, the cost of the neutron flux turned out to be incommensurably expensive in comparison with the value of the produced gold. Gold that was artificially obtained in a reactor is unstable. The prime cost exceeds tens of thousands of dollars per gram and it is impossible even to come any closer to the profitability level.



Cold transmutation
is a path to the future

TECHNOLOGICAL TRENDS

In the twentieth century, studies of nuclear transformations followed the path of the so-called nuclear fission reactions and they can also be called High Energy Nuclear Reactions (HENR). These reactions are caused by a powerful impact on atoms and are accompanied by radioactive radiation. This approach was consistent with the tasks set by the military, namely, to obtain technology for colossal explosions in order to create an atomic bomb and, subsequently, thermonuclear weapons.

In the process of development of nuclear weapons a scientific justification was formulated, stating the fact that for a nuclear transformation the atomic nuclei should be impacted by a high-energy flow. An atom can be split using a «large sledgehammer» - impacts of accelerated charged particles. The further use of thermal energy of radioactive fissile materials in operation of power plants followed the path already laid out by the military.

This technology caused the following problems:

- **Ecological Risk**

  Accelerators produce a lot of extremely dangerous radioactive waste. Nuclear accidents in Chernobyl and Fukushima have demonstrated that high-energy nuclear fission technologies bring high level of risks.

- **Prime cost of production**

  All the elements and isotopes produced in reactors are very expensive, because of the extremely high cost of the accelerators. For example, Californium-252 (252Cf) costs more than $10 million per gram, and only large centralized players can afford the production.

- **Unstable results**

  Reactors and accelerators produce mostly radioactive elements and isotopes. Gold produced from mercury transforms back into mercury or follows the decay chain, emitting hard radioactive radiation.

In the light of the existing problems caused by HENR reactions, nuclear reactions can only be studied at the level of states and super-corporations, so some scientists started to look for other solutions to the transmutation problem. It is about mastering low-energy nuclear reactions, both for obtaining energy and transmutation of chemical elements. However, the development of LENR-reactions didn't comply with the goals and plans of governments. Therefore, the unofficial prohibition of relatively low-energy transmutation, formulated as far back as the eighteenth century during Newton's lifetime, was supported in every possible way. In the modern world, LENR technologies are already recognized, but not many have proceeded to practical work.

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Cold transmutation is a path to the future

LENR-reactions

Under the term **LENR**-reaction is understood a whole bulk of research and experiments. In fact, this phenomenon is found almost everywhere and the point is that different researchers find anomalous heat release and traces of nuclear transmutation in those reactions where, according to the modern conceptions of physics of the microworld, they should not exist. There is something that science cannot yet explain, but numerous experiments and observations prove that it exists.

Modern physics in this situation does not seek to answer the question - how it occurs, but tries to totally ignore this topic wherever it is possible. But there are enthusiasts who understand the promising outlook and continue to study LENR-reactions.

Prehistory

Throughout the history of mankind, there has always existed a point of view that it is possible to carry out a low-energy transmutation. There are credible historical records that prove it. In the Ancient Great Powers - China, India and Egypt - transmutation of chemical elements was known and repeatedly mentioned in various sources. Moreover, nature itself provides convincing examples of these phenomena.

Studies of Kervran

In the 60's of the 20th century a French scientist Louis Kervran drew attention to a number of biological confirmations of low-energy transmutations. As a convincing proof of nuclear fusion in biological systems, he used an example with an egg shell. As it turned out, potassium was transformed into calcium in a duck's body by the following reaction:

$$^{39}_{19}K + ^{1}_{1}H \rightarrow ^{40}_{40}Ca$$

Kervran justified this by the fact that enzymes can promote biochemical transformations using weak nuclear force. He called it «neutral currents».

A similar experiment Kervran carried out with lobsters, which synthesized calcium in water from other elements. After presenting his experiments to the public, Kervran found out that similar experiments and proofs were made by L. Voklen, a French scientist of the 19th century (in 1880).

In 1980 Kervran wrote a book «Biological Transmutations» and later «Biological Transmutations & Their Applications». Kervran's experiments were replicated and confirmed by William Prauth, Germany. In his book Kervran also cites the experiment results of E. Zundel, a chemical engineer of Polytechnic Institute in Zurich. He observed a number of chemical elements contained in dry and sprouted oat grains. The amount of calcium in the sprouted grains always increased, despite the fact that the sprouting took place in an environment completely devoid of calcium.

But Kervran's research was carried out in the 1960s and 1980s, when independent communications were weak. Centralized scientific institutions tried to do their best to compromise Kervran's work, denying the results of his research.

Studies of Fleischmann and Pons

In 1989, Canadian scientists M. Fleischman and S. Pons spoke at a press conference in the US that they had discovered a reaction where a nuclear fusion of deuterium with deuterium occurs. They discovered that during electrolysis in deuterium water using a palladium electrode, additional heat energy is released, which can only be explained by nuclear reactions, occurring according to principles that are different from the ones that we know. It is the principle of low-energy nuclear reaction. Perspectives opened by the development of LENR-reactions, as well as technological and scientific consequences, caused a sharp opposition of the scientific community. However, more and more researchers started to address this topic. M. Fleischman and S. Pons questioned the feasibility of studying nuclear fusion in high-energy fusion devices such as «Tokomak», for which tens of billions of dollars were allocated from the pockets of taxpayers around the world.

Studies in recent years

Yoshiaki Arata, at a conference on physics held in 2008, demonstrated his device that worked using the principle of LENR-reactions. At the same time, another scientist Tadahiko Mizuno achieved certain results in this area as well.

Italian researchers from the University of Bologna **F. Piantelli and S. Focardi** discovered a LENR-reaction of nickel with hydrogen. **Andrea Rossi** was one of the first entrepreneurs who adopted the LENR technology. In collaboration with Sergio Focardi, he created a device based on the principles of LENR-reactions, which generated electricity. In recent years, many installations that generate electricity have been built secretly. .

Two scientific theorists **A. Widom and Lewis Larsen** created a theory of LENR-reactions, the so-called theory of neutron catalysis.

Rickard Lundin and **Hans Lidgren** have also provided a theoretical basis for LENR-reactions.

Yasuhiro Iwamura, Mitsubishi Heavy Industries, is a researcher who deals directly with transmutation using cold nuclear reactions.

This is just a small part of the researchers who achieved positive results in the field of LENR-reactions. Perspectives opened by the development of LENR-reactions, as well as technological and scientific consequences, caused a sharp opposition of the scientific community.

SYNTHESTECH

Cold transmutation
is a path to the future

COLD TRANSMUTATION (LENR)

Most LENR researchers are focused on generating energy, while the low-energy transmutation of chemical elements remained outside the scope of research.

One of the first studies relates to 1989. After the furor sparked by M. Fleischman and S. Pons, their experiments were replicated in the US Navy laboratory. In report "Mass/Charge Anomalies in palladium after electrochemical loading with deuterium" Debra Rolison and William O'Grady recorded in the ultrapure palladium electrode the emergence of rhodium, cadmium, silver and other elements with a very unusual isotopic composition.

Domenico Cirillo in 2004 published results of his works in the article "Transmutation of metal at low energy in a confined plasma in water", where he obtained microscopic amounts of rhenium, osmium and gold, as a result of impact on tungsten.

The most interesting results in transmutation were received by previously mentioned **Yasuhiro Iwamura**. In his works tungsten was transformed into osmium and platinum.

All these studies showed fundamental possibility of transmutation of chemical elements. However, these studies were purely experimental and showed new phenomena as side effects, in search for an energy source, and were not aimed directly at finding a commercially effective method of transmutation of chemical elements.

In our understanding, application of LENR lies exactly in transmutation of elements, since alternative energy sources in the nearest future will cover the demand for energy. However, energy conservation and new technologies are about using new materials, and in this field, there have been no "breakthrough" technologies. There are no alternatives, as the natural sources of valuable elements are depleted, and the demand is growing. LENR-transmutation can cover the growing needs for valuable elements and also bring many new methods of application.

First of all, we are talking about obtaining through LENR-transmutation of valuable elements of the platinum group and gold from cheap starting chemical elements.

Commercial efficiency of LENR-transmutation

What makes LENR-transmutation different from other methods of obtaining chemical elements? First of all, it is the prime cost.

Valuable elements – platinum group metals and gold are extracted from natural resources using a traditional method and cost nowadays $25- $35 per gram. The average prime cost of their extraction is close to these figures. In the richest and most efficient natural deposits, the prime cost of gold mining, for example, can be reduced to $20 per gram. But there are not many such deposits and further cost reduction is complicated. And it is almost impossible to increase production rates, since all available natural deposits are already being used in one way or another.

The prime cost of transmutation by high-energy nuclear fission reactions is simply enormous and ranges from $10,000 per gram, reaching millions of dollars. The same fact relates to isotope separation. The point is that for transmutation of chemical elements through high-energy nuclear fission reactions, particle accelerators require reactors, the cost of which starts from tens of millions and reaches tens of billions of dollars, for example, the Large Hadron Collider. Working with such technical equipment requires, apart from huge expenses, complex management, numerous personnel, a radiation safety system and huge amounts of electricity. The prime cost of high-energy nuclear fission reactions is justified only by the special qualities of the substances obtained, that are useful in different industry branches, especially in medicine, and also as a source of research for scientific purposes.

Like in high-energy nuclear fission reactions, the prime cost of isotope separation starts from about $10,000 per gram of an obtained isotope. These are the lowest prime cost thresholds of obtained chemical elements and isotopes, when using the available methods of transmutation.

Extraction of valuable elements from natural resources has a lower prime cost limit, which will grow with the growth of cost and depletion of deposits. And production by artificial means with the help of high-energy nuclear fission reactions cannot, in any way, reduce this prime cost. It will continue to grow. Such high cost limits the usage of the obtained elements, despite their special qualities.

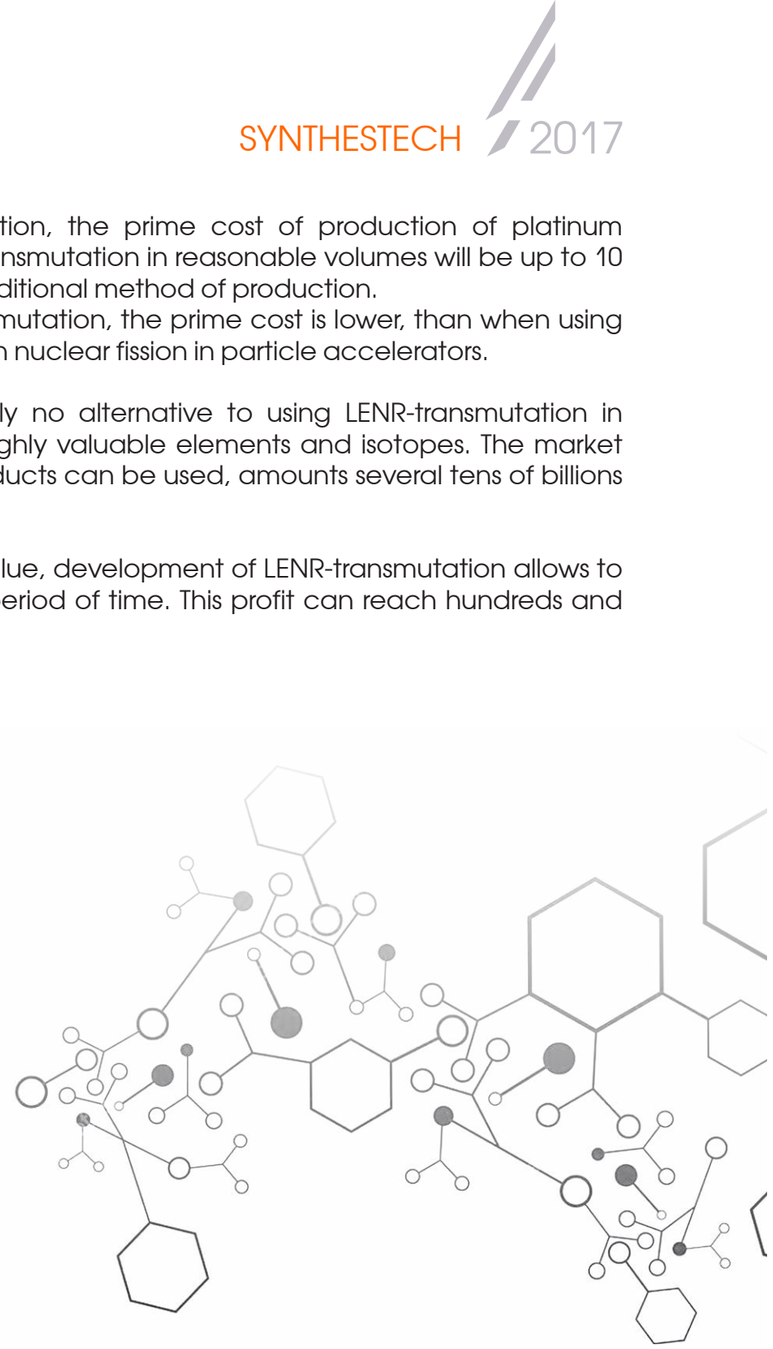
At the same time, LENR-transmutation technology uses cheap chemical elements and a different physical method for the transformation. The prime cost of the obtained elements, as a result of transmutation of low-value chemical elements into valuable ones, is low. The prime cost of LENR-transmutation per unit of a product is much lower, than with extraction from natural deposits. The cost of raw materials, reagents, LENR-transmutation equipment, as well as energy costs, allow us to assume that the prime cost will be significantly lower than with the existing methods of obtaining valuable and highly valuable chemical elements and isotopes.

According to our estimation, the prime cost of production of platinum chemical elements by LENR-transmutation in reasonable volumes will be up to 10 times lower, than the cost of traditional method of production.

Moreover, with LENR-transmutation, the prime cost is lower, than when using high-energy reactions based on nuclear fission in particle accelerators.

Hence, there is practically no alternative to using LENR-transmutation in production of valuable and highly valuable elements and isotopes. The market where LENR-transmutation products can be used, amounts several tens of billions of dollars.

Due to the high added value, development of LENR-transmutation allows to obtain super-profit for a long period of time. This profit can reach hundreds and thousands of percent.



Cold Transmutation will give impetus to the world economy, industry and all spheres of human life

RESEARCHES OF «SYNTHESTECH» IN COLD TRANSMUTATION

Participation in Projects related to Transmutation of Chemical Elements

Vladislav Karabanov, the head of the project of Cold Transmutation (LENR) of chemical elements technology, "Synthestech", has long been seriously involved in the field of low-energy nuclear reaction (LENR) technologies.

Relying upon the experiment results of L. Kervran, A. Kornilova and V. Vysotsky, at the initial stages of our studies, we observed transmutation in microbiological cultures as the most promising model. We established cooperation with inventors Tamara Sakhno and Viktor Kurashov, who received the RF patent for the method of microbiological transmutation in August 2015 (RF patent RU 2 563 511 C2).

In the presented method, bacteria of the genus Thiobacillus (for example, the species Thiobacillus aquaesulis or Thiobacillus ferrooxidans) in the presence of elements with variable valency initiate and accelerate the natural processes of radioactive decay and isotopic transitions of radioactive elements.

Iron ore raw materials containing heavy weakly radioactive chemical elements are treated with an aqueous suspension of bacteria of Thiobacillus in the presence of elements with variable valency. This method results in production of such elements like radium, actinium, thorium, nickel, manganese, bromine, hafnium, ytterbium, mercury, gold, platinum and their isotopes.

In June 2016, Vladislav Karabanov, bearing in mind the development of his project, organized and held a press conference in Geneva. There he informed the public about Transmutation of chemical elements through microbiological method when processing ore materials containing thorium and uranium. This press conference aroused great interest, which promoted the recognition of possibility of cold transmutation (LENR) of chemical elements.

However, Vladislav Karabanov's main task was and still remains the opportunity to implement this invention in the form of production technology and obtain commercial results. Therefore, before raising funds for the project implementation, he studied perspectives of further development of the microbiological method of Transmutation. Members of the Vladislav Karabanov's team, his scientific colleagues and advisors, have carried out a comprehensive analysis of the possibilities of transmutation technology using bacteria.

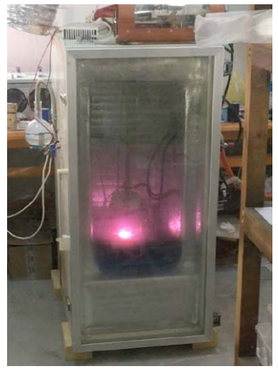
As a result, it became clear that the microbiological method has insurmountable challenges, which make it unpromising for commercial use in transmutation of chemical elements.

RESEARCH OF «SYNTHESTECH»

Development of Cold Transmutation of Chemical Elements. Know-how

Relying upon the gained experience and understanding of the processes of Cold Transmutation of chemical elements, we continued the development of this technology. The main focus was to find an effective combination of reagents and starting elements, as well as methods of impact on the original matrix.

By the beginning of 2017, the necessary components and methods of impact on the original matrix of elements were undoubtedly determined. Several hundreds of experiments were carried out, using various modifications of the Cold Transmutation reactors. Dozens of modifications of the Cold Transmutation reactors have been built and tested. We found a combination of reagents and compositions of chemical elements that initiated the process of cold transmutation. Preparation methods of medium for Cold Transmutation were identified. And also, methods of energy impact on the prepared medium with a matrix of starting chemical elements were developed.

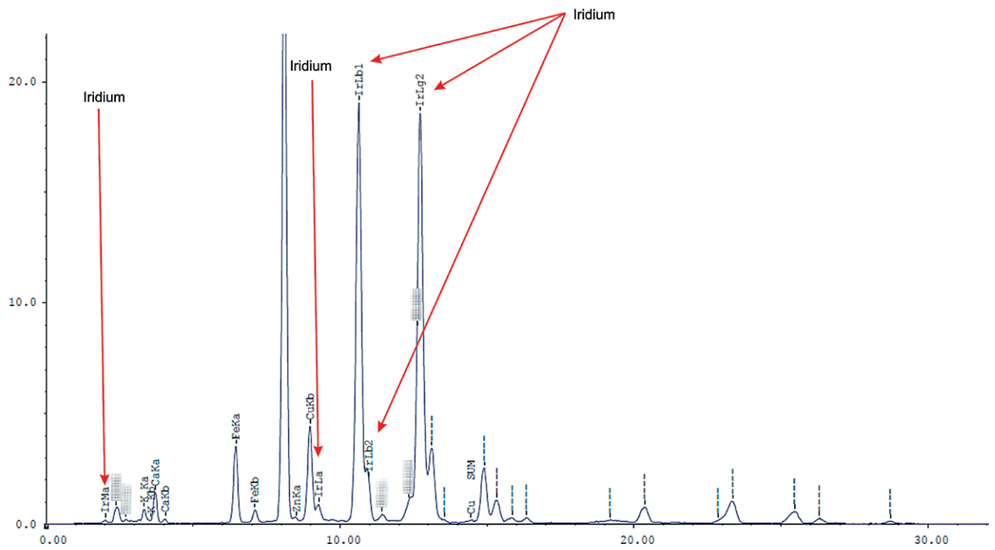


Picture 2. Modification of reactors for Cold Transmutation (LENR).

It is necessary to clarify that we did not seek to delve into theoretical concepts, but focused on practical experiments and results. However, the work of theoreticians, such as Yuri Bazhutov, were taken into account in our experiments.

More than 100 analyzes of the obtained elements were carried out. As a result of using our method of Cold Transmutation of chemical elements, in the matrix of low-value chemical elements (copper, iron, tin, etc.) appeared chemical elements of platinum group - platinum, iridium, palladium, ruthenium. And we also recorded appearance of other elements, which did not exist in the original matrix.

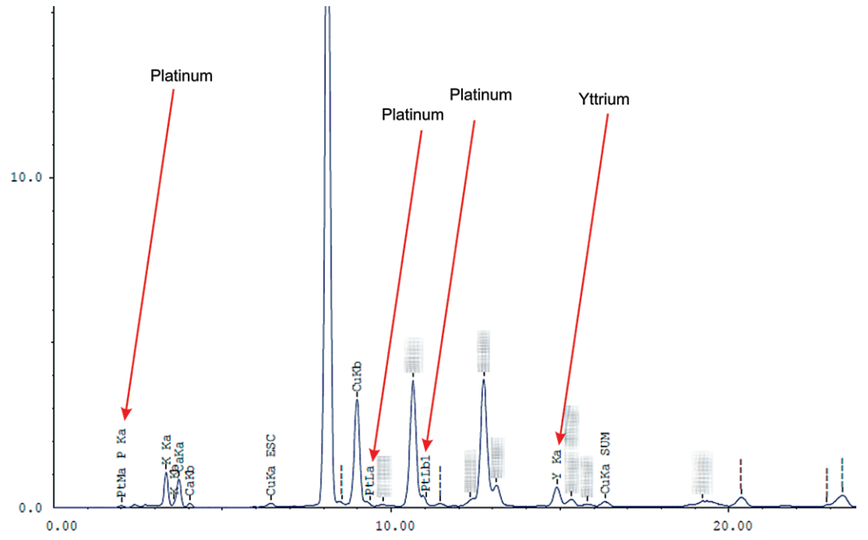
Examples of chemical analysis results that were conducted in a number of independent laboratories



Качественный результат

Элемент: Ir, [illegible], [illegible], K , Ca, Fe, Cu, Zn

Picture 3. An example of a spectrogram showing the content of a valuable element (in this case iridium), which was not present in the starting material.



Качественный результат

Элемент: Pt, P , K , Ca, Cu, [illegible], [illegible], [illegible], Y , [illegible]

Picture 4. Spectrogram showing the content of platinum (Pt), which was not present in the starting material. Also, there was no yttrium (Y).

Also, as a result of transmutation, other new chemical elements were obtained, for example, selenium, germanium, niobium, etc.

Examples of chemical analysis results that were conducted in a number of independent laboratories

Analyte	Result	Proc-Calc	Line	Net Int.	BG Int.
CuO	23.2921 %	Quant.-FP	CuKa	883.636	2.839
P2O5	8.6202 %	Quant.-FP	P Ka	181.162	2.596
CaO	7.9813 %	Quant.-FP	CaKa	140.896	1.605
K2O	5.4336 %	Quant.-FP	K Ka	118.626	1.626
Fe2O3	5.3958 %	Quant.-FP	FeKa	128.733	1.495
Na2O	2.6300 %	Quant.-FP	NaKa	4.130	0.118
Ir2O3	1.2989 %	Quant.-FP	IrLa	21.023	3.100
RuO2	0.3618 %	Quant.-FP	RuKa	7.279	3.607
WO3	0.2996 %	Quant.-FP	W La	5.611	3.031
SiO2	0.2079 %	Quant.-FP	SiKa	1.689	0.232
Ta2O5	0.1610 %	Quant.-FP	TaLa	2.234	2.934
PtO2	0.1382 %	Quant.-FP	PtLa	2.348	3.082
Cr2O3	0.0960 %	Quant.-FP	CrKa	1.123	0.756
NiO	0.0319 %	Quant.-FP	NiKa	1.247	1.867
MnO	0.0302 %	Quant.-FP	MnKa	0.473	1.020

Iridium (Ir)

Ruthenium (Ru)

Platinum (Pt)

Picture 5. Data from another laboratory using other analytical equipment. As a result of LENR Transmutation, iridium, platinum, ruthenium (which were not present in the original matrix) were obtained.

Analyzes were conducted in various laboratories, using various equipment in order to have versatile data. The analysis results confirmed appearance of new elements, among them are chemical elements of the platinum group.

[Quantitative Result]

Analyte	Result	Proc-Calc	Line	Net Int.	BG Int.
NbO	10.5475 %	Quant.-FP	NbKa	98.475	7.221
WO3	0.2997 %	Quant.-FP	W La	2.356	3.109
Fe2O3	0.1254 %	Quant.-FP	FeKa	2.476	1.030
NiO	0.1004 %	Quant.-FP	NiKa	2.178	1.887
SnO2	0.0712 %	Quant.-FP	SnLa	0.269	0.037

Niobium (Nb)

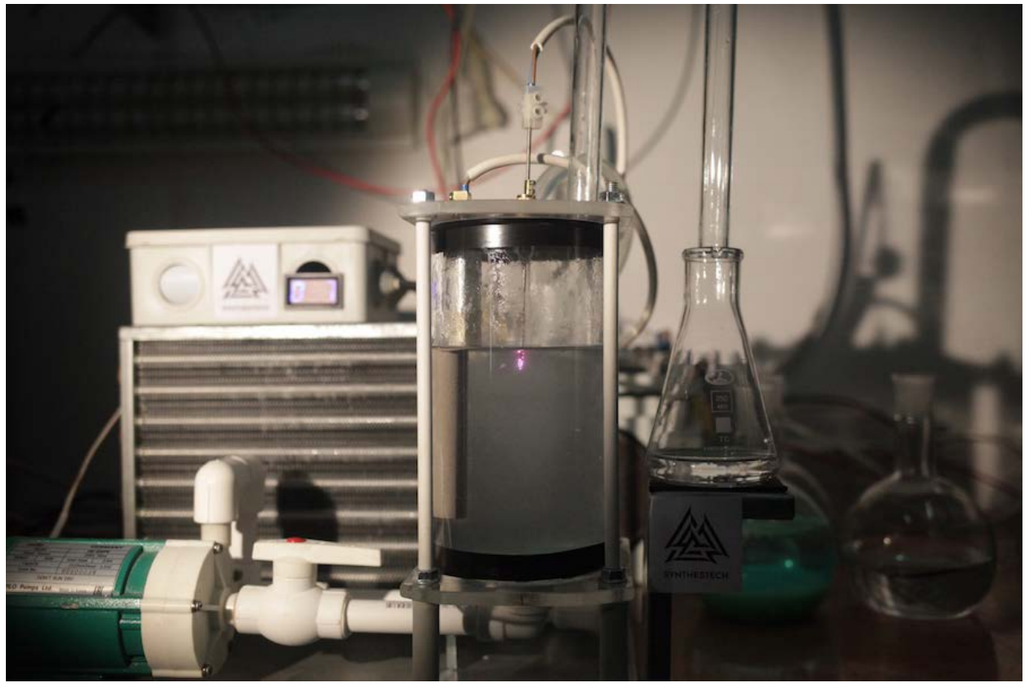
Picture 6. Niobium is obtained through Cold Transmutation. It was not present in the original matrix.

The recorded percentage of valuable substances, obtained as a result of Cold Transmutation of chemical elements, allows us to assume the possibility to develop economically efficient technologies.

OUR KNOW-HOW

At the previous research stage, some processes were discovered that occur during interaction of metals and energy. Several know-hows have been developed that allow us to talk about great commercial perspectives.

Nowadays, objectively evaluating the results already achieved by the Scientific Research group "Synthestech" in the field of Cold Transmutation of elements, we can say with confidence that we have made an impressive progress in this area. Without any doubts, having developed our own unique method, we are much ahead of all those who are engaged in this field. The obtained data allow us to assume great commercial perspectives for development of technologies with high added value.



Picture 7. One of the reactors part.

STAGE OF TECHNOLOGY DEVELOPMENT (2018-2019)

The goal of further research by "Synthestech" is to adjust the technology and develop precise techniques for Cold Transmutation of chemical elements; techniques that will be commercially profitable and industrially scalable.

The work is based on previously obtained data as a result of our own research and on the study results of other scientists engaged in LENR reactions.

Three main areas of work are planned:

- Transmutation of low-value starting elements into valuable elements in order to obtain such elements as rhenium, osmium, iridium, platinum, ruthenium, rhodium, palladium and, perhaps, gold;
- Transmutation of low-value starting elements in order to obtain non-standard isotope mixtures and individual isotopes of stable elements;
- Transmutation of various starting elements in order to obtain bioactive elements for medical purposes with properties, recorded in the sources of ancient Chinese and ancient Indian medicine, as well as in works of the medieval European scientist and doctor Paracelsus.

Researchers are facing the following tasks:

1. Analyze in detail the processes occurring in reactions, previously discovered by "Synthestech" group;
2. Using the obtained data, select the most technologically and commercially promising methods of transformation of some elements into others, in order to conduct a detailed analysis of the specific Cold Transmutation of chemical elements;
3. Develop optimal conditions for a specific LENR-transmutation reaction;
4. Create and test different modifications of reactors for Cold Transmutation of chemical elements; elaborate equipment constructions, materials, tools and so on; select optimal ratios of components of reagents mixture;
5. Produce a pilot batch of artificially obtained elements.

METHODS THAT WE USE:

Empirical

- Repetition of experiments with different parameters (approximately 2,000 experiments).
- Selection of samples of elemental composition with a small periodicity (approximately 6-10,000 samples).
- Formalization of the received results.

Theoretical

Based on the obtained during the work data, the elemental composition will be analyzed, graphs will be constructed to determine the initial and received elements. On the basis of these data, a hypothesis will be put forward about a possible mechanism of transmutation of elements. Experiments will be carried out to confirm the proposed hypothesis.

The theoretical part in the work is secondary, since the main goal is a commercially promising result. However, confirmation of a hypothesis can allow to obtain a theory with a predictive power, and this, in turn, will expand the scope of application areas of the studied process.

Application Areas

The results of research can be in demand in many industries. Below are just some potential areas of application.

synthestech

For the Platinum-group Metals

Autocatalysts

The worldwide fight against environmental pollution caused platinum metals to be used as catalysts for neutralizing exhaust gases.

Consumers: General Motors, Volkswagen AG, Toyota Motor Corporation, Alliance Renault Nissan, Hyundai-Kia Automotive Group, Daimler AG, BMW AG, Fiat Group. Chinese companies also increase consumption, while entering the European and American markets.

Fuel Cells

Fuel cells with platinum catalysts are increasingly being used for portable and auxiliary power units, as well as for environmentally friendly vehicles. The market is not yet very large. There are estimations that it is worth only $1 billion, but it is the fastest growing one, which serves as a growth factor of demand for platinum metals.

Consumers: Toshiba, PowerCell AB, ClearEdge Power, Bloom Energy, Redox Power Systems, Horizon, Nedstack.

Jewelry Products

The jewelry market in the world is one of the oldest ones, its volume is estimated at $140 billion. This is one of the most stable and competitive markets. This market is influenced by trends, and platinum jewelry has been a trend over the recent decades, as an alternative to gold. The rest of the platinum group metals are only at the beginning of their popularity in the jewelry market.

Moreover, they have a great potential to gain a foothold taking into consideration the growing demand.

Consumers: Cartier, Tiffany and Co., Graff, Harry Winston, Van Cleef and Arpels, Piaget, Mikimoto.

Industry

Platinum group metals are used in production of nitric acid, dental instruments, glass, oil, silicone, electronic components, medical equipment, sensors and specialized fabrics.

Consumers: Phoenix Equipment, Dentsply DeTrey, Wacker Chemie AG, AVX Corporation, California Micro Devices Corporation.

Investment Demand

Palladium and platinum are traded on all major exchanges in the world, there are hundreds of foundations that make long-term investments in these metals for a period of 10-20 years. Metal is considered the most conservative asset. The demand grows during crisis and uncertainty in other markets.

Consumers are large foundations: ETFS Platinum Trust, ETRACS CMCI Long Platinum Total Return ETN, ETFS Physical Palladium Shares.

Consumer Market

There are very many materials used in everyday life, which are covered with platinum. Starting from frying pans and razor blades, ending with carbon monoxide detectors and spark plug electrodes.

FOR VALUABLE ISOTOPES

Pharmacology

We consider the use in medicine of artificially obtained chemical elements, obtained as a result of Cold Transmutation, a very promising development direction. The Pharmacological market value, with the use of artificial elements and isotopes obtained as a result of high-energy transmutation in nuclear reactors and cyclotrons, is about $8-10 billion. There is reason to hope that elements obtained through LENR-transmutation will also be in demand in medicine and pharmacology. In this areas, LENR-transmutation results can be very useful, since such elements might have unusual properties and high bioactivity.

Monoisotopic Elements

Monoisotopic elements include selenium-74, iron-57, carbon-14 and hundreds of elements. All of them have applications in various industries, but their cost is extremely high due to the enrichment difficulties. Their main function is labeling the compounds for further study. They are widely used in medicine, as well as in materials science, resistance of materials, in the study of DNA and have many other applications. The isotopic transition is widely known as a LENR phenomenon.

Other Areas of Application

Study of the biological role of transmuted elements

In addition to all the above-mentioned applications, there is another very interesting area, namely, due to which the transmutation of elements has attracted such colossal attention since ancient times. The fact is that there is information from historical sources (Baopu-zi, China; Rasarnava Kalpa, India; Researches of Paracelsus, Europe) saying that elements obtained as a result of transmutation have a powerful and positive biogenic effect on the human body. In ancient times, this effect was considered the main goal of transmutation. Rejuvenation and even achievement of immortality were attributed to it.

It seems that modern mankind is too developed to take different stories and legends of the past serious. However, there are convincing examples, when it turned out that ancient people were right, and modern scientists were not. The most classic example is the nuclear transformation itself. A little over a century ago, scientists were convinced that one element could not turn into another, it was an indestructible dogma. Maria and Pierre Curie, with their works, laid the groundwork for the epoch of studying nuclear transformations and today it has become an industry. Its essence lies in transmutation of some elements into others, but so far with the help of nuclear decay.

Chemical elements obtained as a result of LENR-transmutation can have the same bioactivity, increasing the human life span, as indicated in historical sources of ancient Chinese and Indian medicine, as well as in Paracelsus works.

In this case, the cost of elements, artificially obtained through LENR-transmutation will reach $10,000 per gram or more.

OUR TEAM

Vladislav Karabanov

Head and Founder of the "Synthestech" Project of Cold Transmutation (LENR) of chemical elements technology

Dmitry Pushkarev

Manager of Engineering Work

Roman Karabanov

Head of «Synthestech» Laboratory

Team of engineers

Nadezhda Fedyakina

Community Manager

ADVISORS

Bright minds from all over the world helping us in project development

Krishna Ghezza Matte

Cryptocurrency consultant

Yuri Bazhutov

PhD in Physics and Mathematics

Denis Kozulin

PhD in Chemistry.

Vladimir Krivitsky

PhD in geology and mineralogy at the Lomonosov Moscow State University (MGU)

Sergiy Oliynyk

Doctor of Biological Science

OUR EXPERIENCE

We have identified a combination of reagents and compositions of chemical elements that provide the process of Cold Transmutation, and also developed methods of energy impact that initiate LENR-transmutation. We have developed a basic engineering design of LENR-transmutation equipment. It should be noted that we did not seek to dive deep into theoretical concepts, but focused on empirical methods and practical results.

In a number of experiments, we obtained positive results. We have carried out Cold Transmutation of chemical elements, and from low-value elements we have obtained valuable elements of the platinum group, namely platinum, iridium and palladium. Also, as a result of transmutation, we have obtained other chemical elements like selenium, germanium, niobium, etc. Chemical analyzes of the results were carried out in a number of independent laboratories.

Today, we have reached such development stage of the project on Cold Transmutation of elements, when we already need our own modern laboratory with all the needed equipment that will allow us to figure out the subtleties of the process, to adjust devices and proceed to the pilot production. In addition, it is very important to secure the confidentiality of our developments and our know-how.

At this moment, we have several contracting parties that guarantee us ready markets for our products. Among such products are not only super-valuable elements (our contracting parties are ready to sell a number of such elements), but also iron and zinc, since such elements obtained as a result of transmutation are proved to be in great demand. Iron and zinc are in demand for medicine as bioactive elements, as well as for scientific researches. Their cost can turn out to be much higher than the cost of platinum elements.

STT-TOKENS

Nowadays, we see tremendous opportunities for further development of LENR-technology and, the associated with it, technology of transmutation of elements and isotopes.

We invite partners and investors to join the "Synthestech" laboratory and participate in the Token Generation Event (hereinafter TGE). In the frames of this event, "Synthestech" will issue tokens on the Ethereum platform and sell them to a wide range of investors for bitcoins and ethers. The raised funds will be used for construction of the "Synthestech" laboratory, formation of a global team of specialists and carrying out of researches.

PARAMETERS AND FUNCTIONALITY OF TOKENS

"Synthestech" tokens (ticker - STT) are dividend tokens, which give the right to receive 36% of the profit of ST Global inc. company incorporated in Belize. The company's profit can be generated by obtaining royalty from the developed technology for LENR Transmutation or the subsequent launch of production of transmuted elements and isotopes.

STT Tokens do not grant shareholder rights, but are provided with 36% of ST Global inc. company shares through the planned emission of 10,000 investment certificates (working title). 10, 000 certificates are equal to 100% of ST Global inc. company shares.

From a technical point of view, tokens are provided with a smart contract on the Ethereum platform that meets the ERC-20 standard and investors can store them in different wallets and services.

There will be a limited number of STT tokens issued during the TGE. The total number and details you can find in token sale terms. There will be no additional token issuance, i.e. the total number of tokens after the TGE cannot be increased. All information about the smart contract will be provided on GitHub and offered to the community to launch Bug Bounty before the TGE.

The STT tokens will be sold by ST Global inc. company. Legal Terms and Conditions will be properly developed and posted on the official website

www.Synthestech.com/TST.pdf

TGE will consist of two stages: Pre-Sale and Crowdsale. Details of the TGE stages will be timely disclosed on all official social media platforms of "Synthestech": Facebook, Twitter, Medium, Reddit, on the "Synthestech" and TGE sites.

LABORATORY

Project «Synthestech» plans to launch the laboratory in Sochi (Russia) and, subsequently, start production in Switzerland.

We chose Sochi because of the developed infrastructure (the city hosted the Winter Olympic Games 2014), availability of highly qualified personnel, reasonable utility cost and good global transport accessibility. It is also important that the city is an attraction center of experts on LENR-technologies from Eastern Europe and Central Asia. In Sochi, for example, the International Conference on Cold Transmutation and Ball Lightning is held every year.

Moreover, some research works and analyzes, for example, on neutron activation, will be carried out in Switzerland.

Picture 8. Design solutions of the "Synthestech" laboratory in Sochi.

According to the preliminary design solutions the laboratory will be constructed on a separate location and will have a total area of 1000 square meters together with auxiliary facilities.

The laboratory will consist of:

- 4 specialized laboratory departments;
- analytical laboratory equipped with 1-2 mass spectrometers and other research and analytical devices;
- laboratory for substance separation equipped with chemical cabinets, cleaning systems, thermal equipment and filters;
- experimental laboratory;
- licensed laboratory that will allow to use radioactive substances;
- 3 workshops for production of experiment devices and small amounts of products;
- conference hall;
- offices for administrative and management personnel;
- utility rooms.

Picture 9. Design solutions of the "Synthestech" laboratory in Sochi.

The workshops will be equipped with modern high-precision processing complexes and 3D printers for printing metal parts of devices.

All studies will be conducted in accordance with the plan.

TIMING

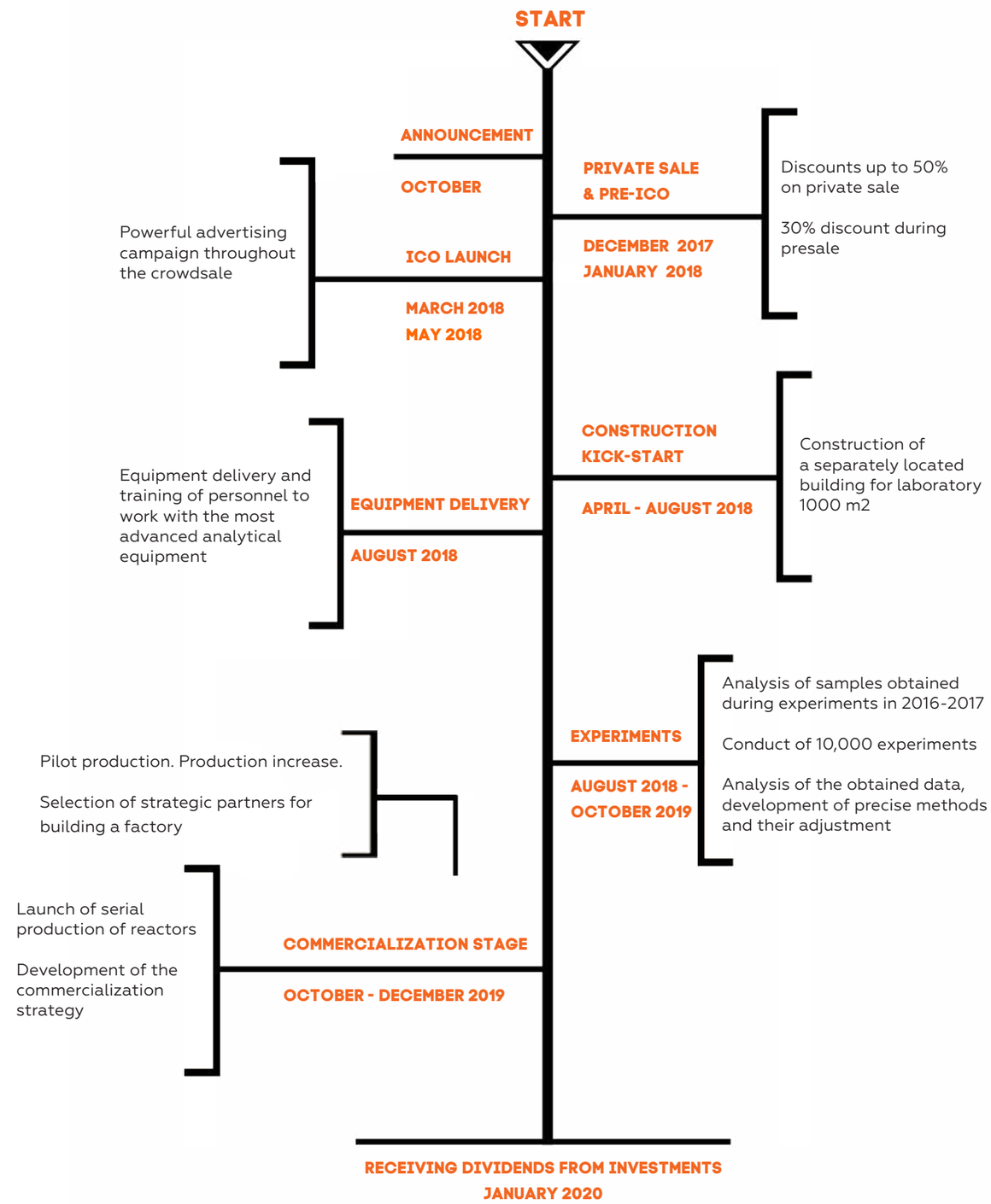
So, "Synthestech" team plans to transform the acquired knowledge into the efficient industrial technology with high added value, in the shortest possible time.

Products of this technology - artificially obtained chemical elements, will be immediately accepted by the market, since they are basic materials, massively used in industry, jewellery and medicine. These products do not need licensing or anything else.

As the project progresses, starting with construction of the laboratory, we expect a significant increase in its capitalization - dozens of times, in relation to the initial costs. Because, the technology of Cold Transmutation of chemical elements promises to lead to a revolution in the economy and industry.

The profit in the first months of production output will increase in accordance with the growth of production capacity.

The use of Blockchain technology will allow to provide regular payments to "Synthestech" token holders in any convenient form. If possible - on a quarterly basis.



EXPENDITURE OF FUNDS

LEVEL 1. Raised less than 1 million

Purchase of a mass spectrometer and a limited set of Chinese equipment for analysis of the obtained elements and separation, purification of substances. Continuation of work in the current mode in a rented laboratory.

Manufacture of reactors for Cold Transmutation by artisanal methods.

Work aimed to obtain 1-2 elements of platinum group.

It is planned to receive results within 18 months.

LEVEL 2. Raised less than 5 million

Purchase of equipment for analysis and purification of obtained substances, produced by advanced countries (EU, USA, Japan) along with China.

Miner processing units for production of pilot reactors for Cold Transmutation.

Construction of our own laboratory - 50% of the planned capacity.

Work aimed to obtain 5-7 elements - platinum group metals and Germanium.

LEVEL 3. Raised less than 13.5 million

Purchase of complete sets of the most modern equipment to carry out analysis of the obtained substances. Equipment is produced in the USA, Europe and Japan.

Purchase of complete set of high-precision processing unit with a 3D metal printer for production of Cold Transmutation reactors. Equipment is produced in the USA, Europe and Japan.

Construction of a full-scale laboratory.

Work aimed to obtain the full range of valuable chemical elements and isotopes.

LEVEL 4. Raised over 13.5 million

Work aimed to obtain ultrapure elements and isotopes.

Study of the possibility to use the obtained elements in Medicine.

Expansion of the laboratory with the possibility to launch a pilot production, depending on the amount of funds.

Token Sale Details

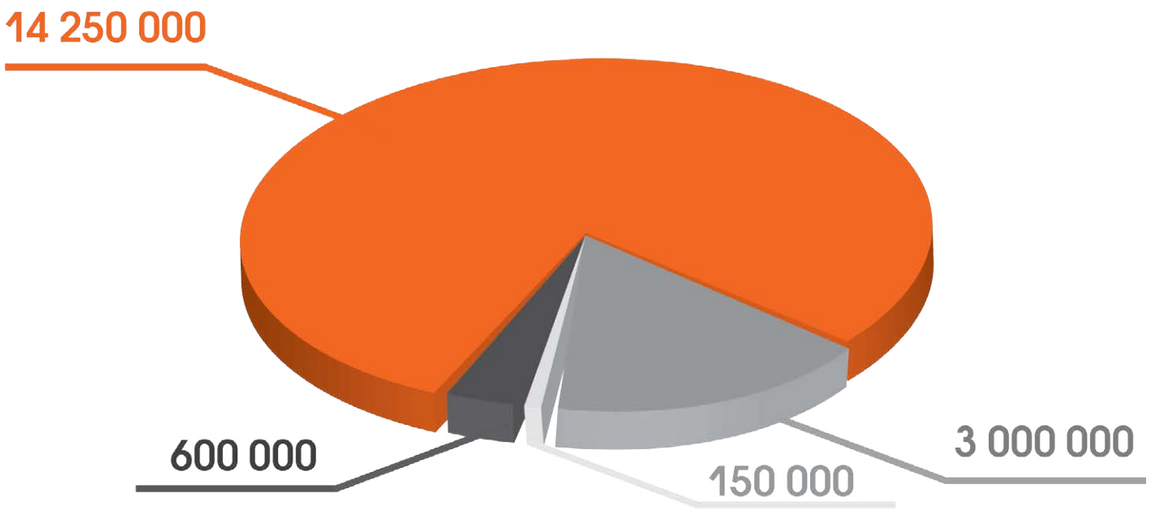
Token sale is held by the company ST Global inc. company incorporated in Belize.

ST Global inc. company conducts research studies of the phenomenon of cold nuclear transmutation of chemical elements, in particular, transmutation of low-value elements into valuable ones. The ultimate goal of our research work is development of commercially applicable technology.

Commercial name of the project is Synthestech
Name of Token: Synthestech Token, (Ticker STT)

Cost of 1 STT is equal to 1 USD*

The total token emission during the Token sale event is 18,000,000 STT tokens. This entire quantity of tokens grants 36% of the profit received from the commercialization of technology. Payments to the token holders will be made automatically, to the address of Ethereum wallet which they are using at the time of payment, at the current Cryptocurrency exchange rate of Ethereum to US Dollar.



Tokens allocation:

- 3 000 000 Early investors exchange fund
- 150 000 Bounty campaign
- 600 000 Pre-Sale
- 14 250 000 Crowd Sale (ICO)

Unsold tokens will be reserved by the Issuer and will be later put up for sale.

*The issuer reserves the right to raise token prices only at the stage of Crowd Sale

APPENDIX NO. 1 ON AMENDMENTS:

February 16, 2018

Due to the need to adjust some additional beneficial terms for ICO participants, which were not provided in the basic version of White Paper, the following amendments have been made:
1. The profit margin has been increased from 30 to 36 percent - part «Parameters and functionality of tokens» (page 41)
2. The Roadmap timing of the work process has been changed (page 45).
3. An outstanding Russian scientist in geochemistry, Vladimir Krivitsky, PhD in geology and mineralogy at the Lomonosov Moscow State University (MGU), author of numerous scientific articles and 3 books on transmutation of chemical elements, joined the Synthestech team of advisors to support us in development of our Project. We prepared interview with our Advisor Vladimir Krivitsky.
https://youtu.be/dgz0bHHrDOE (page 39)
4. Token Sale Details has been added. (page 47)

March 05, 2018

5. Doctor of Biological Science, Sergiy Oliynyk, author of more than 200 scientific works and 10 patented inventions, acting engineer and researcher in the R&D Center Weverinstruments Co., LTD, Seoul, Korea, joined the Synthestech team of advisors to support us in development of our Project.
6. ST Global Inc. will conduct TGE to avoid unnecessary taxation and simplify regulation.

A new era has come

Technologies are changing the world.
What previously seemed to be impossible, today is already the reality.

The time for changes in nuclear physics has come.
It's time to save the planet.

Decentralized systems change the paradigm of decision-making, and there is no doubt that the world will abandon high-energy nuclear reactions and return to natural processes, and then will go further to new heights in technologies for obtaining valuable elements - technologies of Cold Transmutation of elements of "Synthestech".