

Introducing a New Concept of De-Radioactivity

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Abstract

De-radioactivity is characteristically opposed to the concept of radioactivity. The possible mechanism behind the concept of de-radioactivity involves the intra-trapping, intra-embedding and intra-fixing of the metallic radioisotope or stable isotope within the framework of the novel molecules loaded with the potential transfer of excess electrons to the metal nucleus to suppress the decay of the instable neutron to the proton and electron with the release of energy, stabilising the stable isotopes or metal radioisotopes so strongly as to result in zero dissociation of metal (stable isotope or metal radioisotope) and thus depriving metal radioisotope of its free status - an essential condition of metal radioisotope to decay. The whole study has been based on metal stable isotopes extendable to metal radioisotopes. The novel molecules (SSS-101, SSS-102, SSS-103 and SSS-104) which bring about intra-trapping and intra-fixing of the metal radioisotopes are called Radiostabilisers. Humanity may find a silver lining in this new concept for future safety with its possible wide spectrum practical applications. Radiostabilisers may help in the purification and reclaiming of metal radioisotope(s) contaminated sea-water or water, atmospheric and the nuclear liquid waste materials. The radiostabilisers fail to intra-trap the stable or radioisotopes of hydrogen, helium, carbon, boron, phosphorus, iodine, neon, argon, krypton, xenon, oxygen, fluorine, sulphur and chlorine.

Keywords: De-radioactivity; Isotope; Radiostabilisers; Radioactive soil; Neutron; Proton; Electron

Introduction

The subjective and objective conceptual clarity, analytical ability and application skill are the key or basic factors which may generally give lead(s) to propose a theory or new definition of new phenomenon, its scientific confirmation and applications in-line with the experimental data generated thereon. In 1904, Marie Sklodowska Curie [1] opened the atomic age, introducing the concept of radioactivity, defined as the spontaneous disintegration of certain nuclei accompanied by the emission of alpha particles (helium nuclei), beta particles (electron or positrons) or gamma radiations (short wave length electromagnetic waves). Since then this subject and its allied areas have been scientifically expanded by Mme. Sklodowska Curie [2], Carter, Gosling, Charles, Robert, Froman [3-13] with its positivities on record which include its application in radioactive dating, radio-astronomy, radiography, radiolocation, radioisotope imaging, radio telescope, radio therapy, nuclear medicine(s), covering organal functioning (s) exploring deficiencies of bio-organics in the human body, and treatment of refractory diseases to name a few (Oxford Dictionary of Physics [14]). The negative scope of radioactivity covers up development of nuclear weapons of mass destruction (atom bomb, cobalt bomb, neutron bomb and hydrogen bomb) (Oxford Dictionary of Physics [14-18]), applying the concepts of fission and fusion, if employed and used upon earth shall lead to complete extinction of humanity upon earth. Besides anthropogenically defined and developed nuclear arsenals, the geologically defined radioactive deposits also pose danger(s) to humanity. Some nations have developed nuclear weapons to seek parity with other nations and employ them as the political tools.

The anthropogenically defined human activities: climate change and the misuse of the concept of radioactivity have already foretold the possibilities of human extinction if remain unchecked or unreclaimed. The possibility of the frequent use of nuclear weapon upon earth with the control on them by home-grown terrorists or terrorism-oriented international out-fits, cannot be ruled out. The solution to the bad sciences- an attribute of radioactivity -cannot be solved with the mentally defined desires of worldly defined hegemonic politics in the world politics. This solution may be a possibility if the world leaders believe in Trust, not suspicions, Cooperation, not dominance

and Inclusivity, not exclusion, which is a remote possibility as it is a difficulty to see all the world politicians on the same page.

The solution and resolution of the radioactivity defined bad sciences may be made possible by the scientific intellectual brains with a human heart desiring to protect humanity upon earth - the best natural creation settled in the timelines of evolution and natural selection. The alternatives to radioactivity may include the development and the defining of New Term De-radioactivity - a new concept to reverse the bad effects of the radioactivity defined bad sciences to certain extent.

The stable isotopes like Co-59 and Sr-89 and their radioisotopes like Co-60 and Sr-90/91 display similarity in chemical reactivity except the signs of radioactivity by the latter. This chemistry acted as a base on which it was built up to seek the conceptual clarity on the concept of de-radioactivity employing stable Co-59 and Sr-89 isotopes, and the coded molecular signatures. SSS-101, SSS-102, SSS-103 and SSS-104 loaded with electron rich points (ERP) as the model candidates with the potential to intra-trap stable or radioactive metals and metaloids.

Experimental Methods

The analytically pure chemicals were used. The radioactive soil samples were collected From the TARA HILL Dehradun (UK) India at different GPS coordinates (Table 1). Geo-location of a soil sample collection spot is shown in Figure 1.

The equal volume and molarity of the each of the aqueous solution of the stable isotopes: Co-59 and Sr-89 were treated and reacted with the aqueous saturated solutions of each of the coded signatures (SSS-

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101, SSS-102, SSS-103 and SSS-104). The precipitate so obtained was filtered, washed and dried at before 50°C in the oven. The dry mass was subjected to thermal profiling with the thermal technique. The state of the art TG/DTG/DTA instruments were employed to register the thermally defined profiles of the end but dry byproducts of two players. The TENMARS Radiation meter (TM-91/ TM-92) (Tenmars Electronics Co Ltd.) was used to measure emitting radiation of the pre-treated and after-treated soil samples of Tara Hill (UK) India with the saturated aqueous solution of the coded signatures. The GPS coordinates of each spot (altitude and longitude) was noted using GPS device (Table 1).

Results and Discussion

The radioactivity concept led to new terms: nuclionics and nucleosynthesis which have consequently given lead(s) to the development of fission-based (atom bombs, Cobalt bombs), fusion-based (neutron bombs) nuclear devices, possessed by USA and Russia, (6000-7000 arsenals in their stockpiles), and UK, China, France, Israel, India, Pakistan and North Korea each of which having nuclear arsenals in the range of 50-300. Only 10-20 nuclear bombs are sufficient to explode the whole earth and humanity. The attendant dangers are due to the nuclear waste(s), comprising of solid, liquid and gaseous waste materials that contains metallic radioisotopes, the mining and processing geological radioactive ores and the normal running of nuclear power stations and the atomic reactors, being expanded at large scale(s) in the world. The hospitals and research laboratories using Co-60 radioisotopes and other ones add to the dangers of radioactive waste materials(s). The nuclear waste has been sub-divided into 03 categories, first, high level waste, an extremely dangerous to all living matter and contains radionuclides having half-lives of thousands of years; their disposal must be controlled with great stringency. The spent fuel is an example which requires to be cooled artificially and

storing for several decades by its producers before it can be deposited off. Second intermediate level waste (processing plant sledge and reactor components), is solidified mixed with concrete chambers in deep mines or sea-beds. Third, low-level waste (solids or liquids) lightly contaminated is buried at special sites in concrete-lined trenches). The statistics show that the nuclear powers worldwide have developed procedures to dispose of radioactive waste(s) which do not hold waters and are likely to contribute heavily to the extinction of humanity sooner or later upon earth [2,15,19].

The above statistics have been received with shocking experiences prompting us to find alternative concept(s) and procedures to deal with such challenges. The thermal data analytics suggested that each mole of Co-59 or Sr-89 was intra-trapped and intra-fixed by each mole of SSS-101 and SSS-102 whereas 03 and 05 moles of each of Co-59 and Sr-89 interacted with each mole of SS-103 and SSS-104 respectively. The thermal profiling showing sigmoids and plateaus led us to believe the departures of the protruding side chains at before about 300°C after which each profile displayed plateauing suggesting higher thermal stability of each of derivatives.

The radioactive soil samples collected at different points on TARA HILL, India emitted 0.34-0.37 $\mu\text{Sv/h}$. which lowered down by 30-40% on the saturation of the soil samples with the saturated solution of each of the coded signatures, suggesting the intratrapping and intra-fixing of the daughter radioactive elements formed from the decay of the parent radioactive deposits probably metal oxides in the Hill Soil. The parent radioactive deposits could not be intra-trapped and intra-embedded due to their water insolubility. The coded SSS-101 (ERP: 02), SSS-102 (ERP: 03), SSS-103 (ERP: 03) and SSS-104 (ERP: 05) signatures with the electron rich points (ERP) are potentially capable of intratrapping and intra-fixing all metals and metalloids. These molecular signatures fail to intra-trap the non-metals. Conclusively these signatures are best

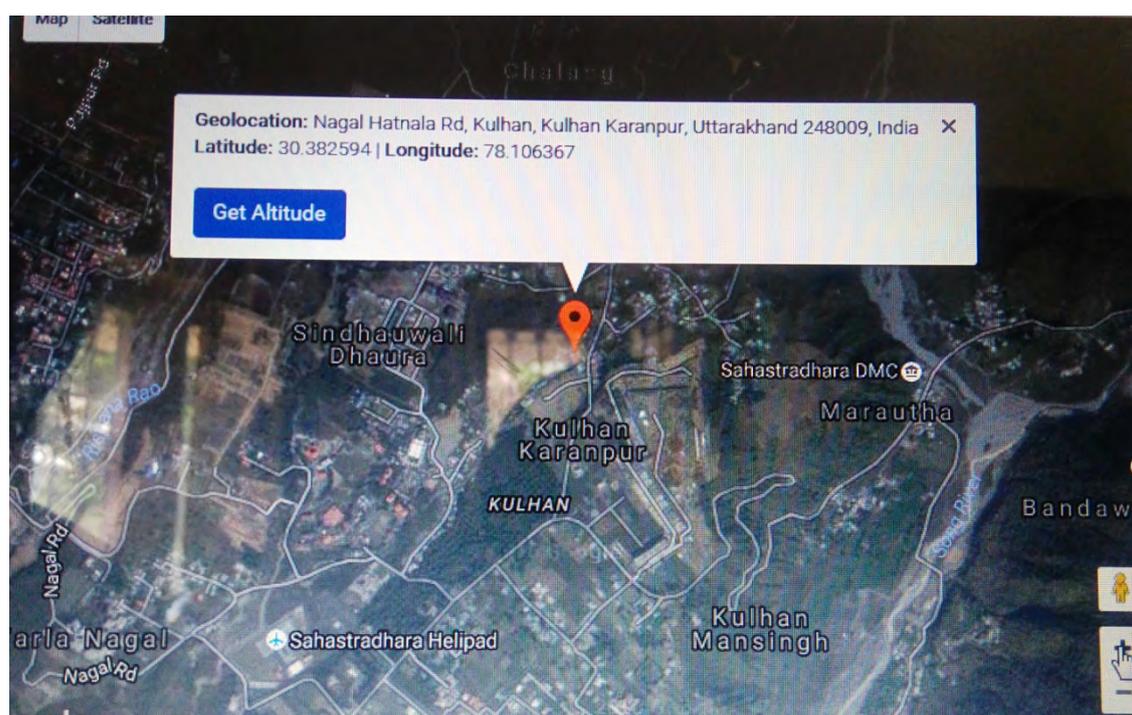
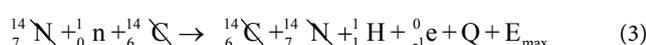


Figure 1: Geo-location of Soil Sample Collection Spot.

Points	GPS Coordinates		Radiation ($\mu\text{Sv/h}$)
	Altitude	Longitude	
I	30° 23' 46.44" N	78° 06' 24.00" E	0.37
II	30° 23' 45.66" N	78° 06' 27.63" E	0.35
III	30° 23' 47.18" N	78° 06' 29.16" E	0.34
IV	30° 23' 46.84" N	78° 06' 25.48" E	0.36

Table 1: Radiation Data on the TARA HILL Samples Collected at Different GPS Coordinates.

candidates to intra-trap and intra-fix the metallic and the metalloid isotopes (Stable and radioactive as well). The concept of de-radioactivity was built upon the points as above. Consider the nuclear reaction ^{14}N (n, p) C^{14} .



The equation (4) is basic forward reaction causing spontaneous nuclear decay of nucleus neutron to proton (${}^1_1\text{H}$) and an electron (${}^0_{-1}\text{e}$) with the emission of radiation when the nuclear isotopes are in Free State, suggesting that the intra-equilibrium of nucleus remains disturbed with the readiness of neutron to decay. There are two emerging possibilities to arrest the decay of metal radioisotopes. First, the metal radioisotope decay may be stopped with the reversing of forward reaction (eq. 4). Second, the metallic radioisotopes should be intra-trapped, intra-fixed and intra-embedded with the supply of electrons to the products of the forward reaction (eq. 4). The coded SSS-101, SSS-102, SSS-103, SSS-104 candidate signatures could achieve the target(s) of intra-tapping, intra-fixing and intra-embedding the stable isotopes or metal radioisotopes, as both assume chemical similarity except the tendency of metal radioisotopes to decay, centrally within the frame work(s) of these signatures with ERPs which supply extra electrons (two electrons per EPR) to the nucleus reversing possibly the forward reaction.



suggesting the possibility of the final reaction under the applied conditions



Further the applied conditions could probably cause the nucleus to attain intra-equilibrium as the intra-trapped metal radioisotope might have been stripped off its free status -the necessary condition to decay, as the resultant product of the stable or metal radioactive isotope could not show signs of dissociation. Secondly the products were found thermally stable at 300°C and beyond. Thirdly the structural framework intra-fixing and intra-embedding the stable radioactive isotope remained intact even at 300°C and beyond. The explanation led to define the new concept of De-radioactivation under the applied conditions. De-radioactivity being opposite to the concept of radioactivity is a phenomenon which involves the arresting of the disturbed intra-equilibrium of nucleus with these novel signatures loaded with ERPs. The novel signatures which help stopping decay of metallic radioactive isotopes are called Radiostabilisers.

The concept has been found valid for metallic radioisotopes only. The coded SSS-101, SSS-102, SSS-103, SSS-104 are potentially unable

to intra-trap, intra-fix and intra-embed the stable isotopes or radio-isotopes of hydrogen, helium, carbon, boron, phosphorus, iodine, neon, argon, krypton, xenon, oxygen, fluorine, sulphur and chlorine. The possible mechanism behind the concept of De-radioactivity involves the intra-trapping, intra-embedding and intra-fixing of the metallic radio-isotope or stable isotope within the framework of the novel molecules with the potential transfer of excess electrons from the ERPs thereon to the metal nucleus to suppress the decay of the instable neutron to the proton and electron with the release of energy, stabilising the stable isotopes or radio-isotopes so strongly as to result in zero dissociation of metal (stable isotope or radioisotope) and thus depriving metal radioisotope of its free status - an essential condition of metal radioisotopes to decay. The humanity may see a silver lining in the development of the concept of de-radioactivity for its future safety upon earth. The radioactivity -related attendant challenges as said above may be met successfully in years to come with the practical application of the concept of de-radioactivity and radiostabilisers.

On the horizon

The definition of de-radioactivity and Radiostabilisers with the potential (s) of intra-trapping, intra-fixing and intra-embedding the metal radioisotope(s) so strongly to cause zero dissociation of the resultant product stripping off the free status of metal radioisotopes - an essential condition to decay, have been said to have the promising future to meet the radioactivity -oriented attendant challenges which have failed the world scientists to deal with so far. These radiostabilisers may de-radioactivate the metal and metalloid radioisotopes (parent and daughter ones) inherently part of the nuclear waste(s) of all categories on reacting the aqueous solution of the Radiostabilisers with the liquid phase of the nuclear waste(s). The burying of the treated nuclear waste(s) after treatment may not ill-effect the population, as the structural framework of the byproduct(s) of the players holding radioisotope could be found thermally stable at 300°C and beyond. Secondly the geological radioactive deposit(s) emitting radioactive radon gas polluting the natural atmospheric may be fixed effectively with the continuous or periodical spray of the aqueous solution of these radio-stabilizers, meeting the cause of concern of the geological radioactive deposit(s).

Thirdly the radio-stabilisers may act as nuclear drugs which may be used to protect the humanity at the time of atomic attack as the metal radioisotope spin off entering the human system may be intra-fixed and the resulting by-product may be excreted out of the body as these by-products are water soluble.

Fourthly the radio-stabilisers may act as the friendly signatures and protective shields in peace against the metal radioisotopes being inhaled by the nuclear scientists attending the processing of nuclear reactors for various causes, and the hospitals and the nuclear research laboratories where the metal radioisotope(s) such as Co-60 etc are frequently used and handled. Fifthly these radiostabilisers are the fit candidates to deactivate the sea or river water laced or contaminated with metallic radioisotopes as recently reported in Japan and India. Above all the radiostabilisers may be taken as the best friends of humanity upon earth-the need of the hour.

Conclusion

De-radioactivity is a New concept which characteristically opposes the concept of radioactivity. The molecular signatures laced with the ERPs with the potentials to intra-fix the metal radioisotopes centrally within the framework of these signatures, are called radiostabilisers

having the inherent capabilities to meet the challenges of the radioactivity defined bad sciences. The radiostabilisers may be proved the best friends of humanity upon earth in future.

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