

New Isotope Separation Method Will Avert Mo-99 Shortage



University of Texas researchers have developed an inexpensive method of isotope enrichment that could put an end to the critical shortage of isotopes commonly used in nuclear medicine, such as Molybdenum-99. Magnetically Activated and Guided Isotope Separation (MAGIS) consumes a fraction of the electricity involved in the most current method of separating isotopes using a calutron. The report has been published in *Nature Physics*.

Averting a Crisis In Nuclear Medicine

Molybdenum-99 is used in nuclear medicine for the benefit of millions of people undergoing heart, kidney and breast imaging. Many of the isotopes used in such procedures are separated by a nuclear reactor in Canada that is scheduled to cease production in 2016. The reactor is old, but so is the calutron technology at its core: the newest calutron was built in the middle of the twentieth century in Russia.

Enter magnetically activated and guided isotope separation. Mark Raizen, the study's author and a physics professor at the university, believes that MAGIS will replace calutrons as the main method for separating isotopes. Whereas current technology can cost \$30,000 to \$50,000 in electricity just to separate a single gram of material, MAGIS may cost \$30 -- a thousand times less.

MAGIS and Cancer Therapy

Not only will MAGIS transform nuclear medicine with its ability to efficiently provide isotopes for medical imaging procedures, but it will play a role in a new type of cancer treatment. Radioimmunotherapy makes use of the isotopes Copper-64 or Lutetium-177, both of which can be produced by the MAGIS system of isotope separation.

Raizen's nonprofit foundation, which has patented the MAGIS method, will include an oncologist to help guide the team's work. The Pointsman Foundation also consists of Raizen, the University of Texas Health Sciences Center at San Antonio's head of radiology, and a paediatrics professor at Baylor College of Medicine. Initial funds are currently being raised through philanthropic donations with the hope of making MAGIS accessible to medical practitioners.

Innovation Leads To More Innovation

It is also possible that MAGIS could one day play a role in the development of new stable isotopes to be used in medical imaging. The field of nuclear medicine has been stifled by the high expenses and low availability of isotopes, but if that changes through the use of MAGIS, scientists will be more free to explore novel imaging methods and therapy techniques.

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Published on : Mon, 7 Jul 2014