MOLECULE MODIFICATION COULD IMPROVE REPROCESSING OF SPENT NUCLEAR FUEL

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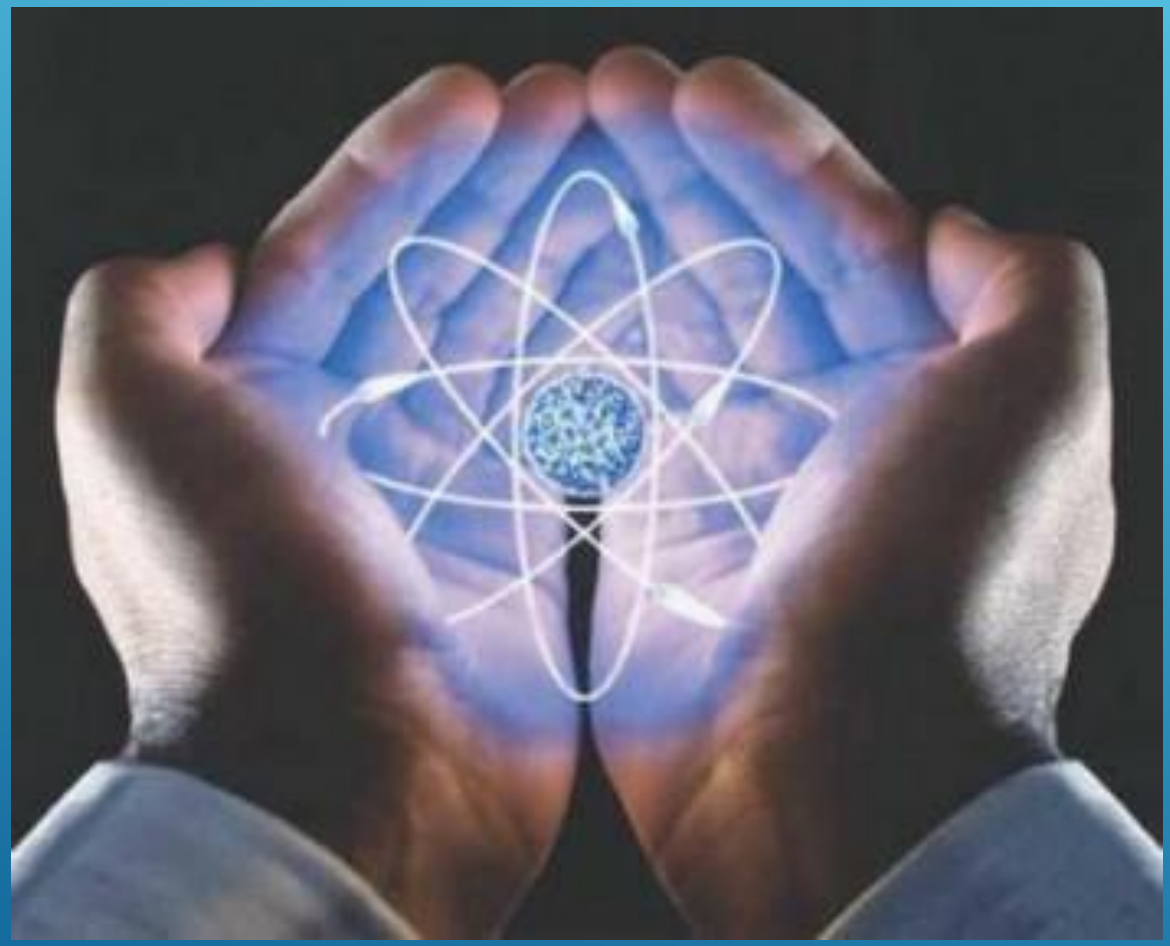
contents:

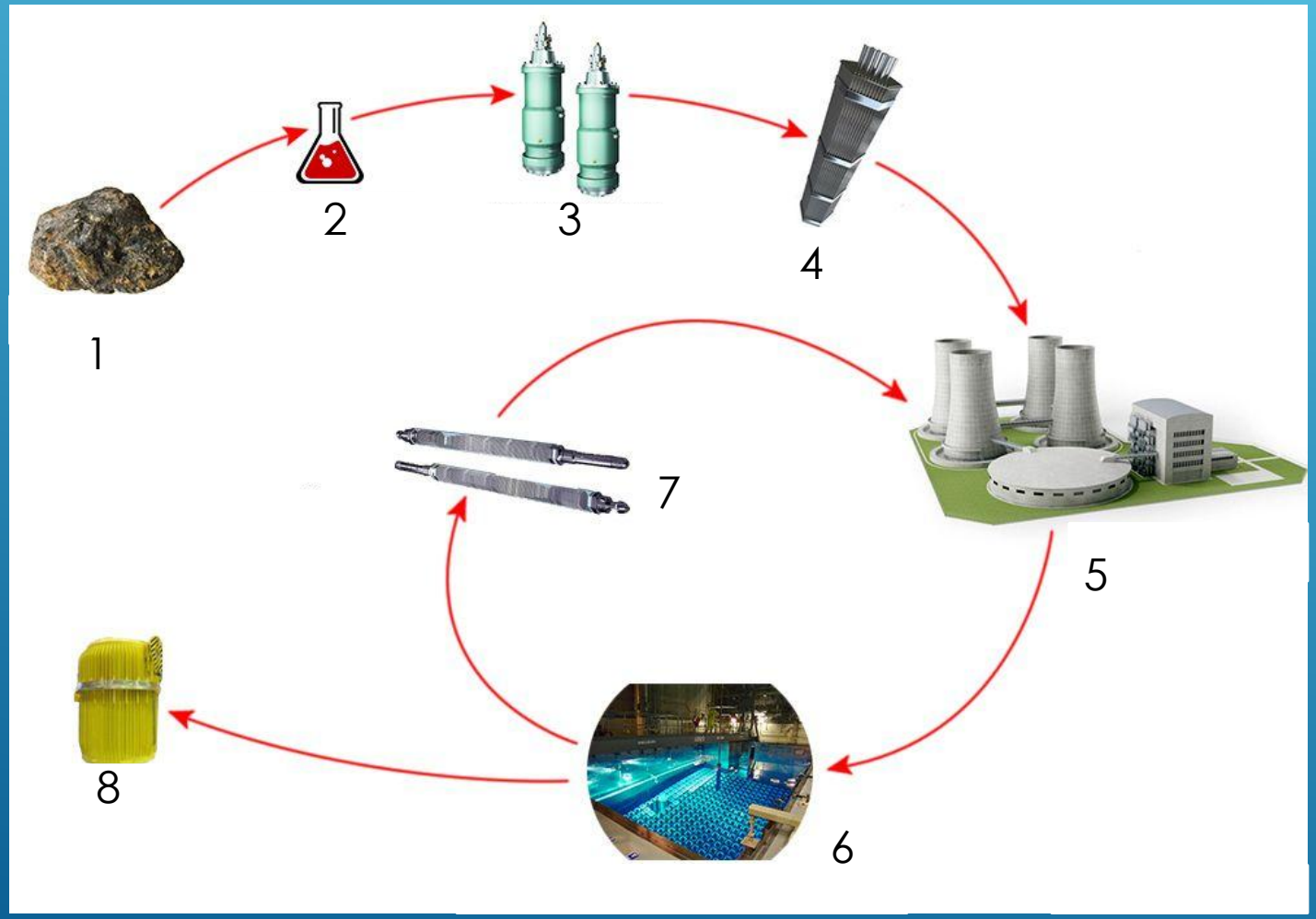
REPROCESSING SPENT NUCLEAR FUEL MAY BECOME SAFER AND MORE EFFICIENT IN THE FUTURE.



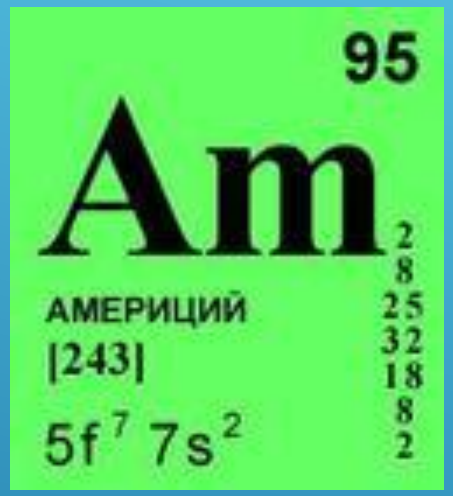
About 10% of the world's electricity is produced by nuclear power

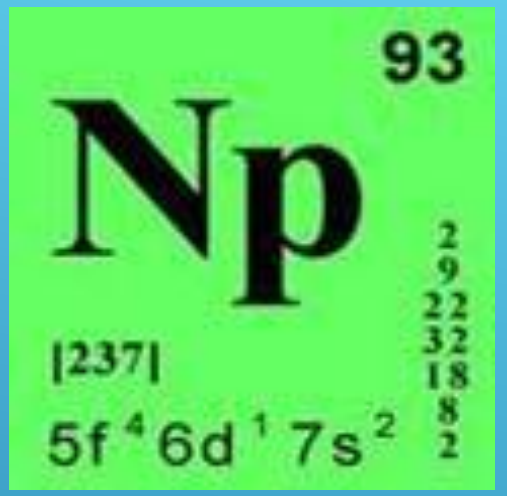
nuclear power stations need fuel to produce electricity

The reprocessing operation



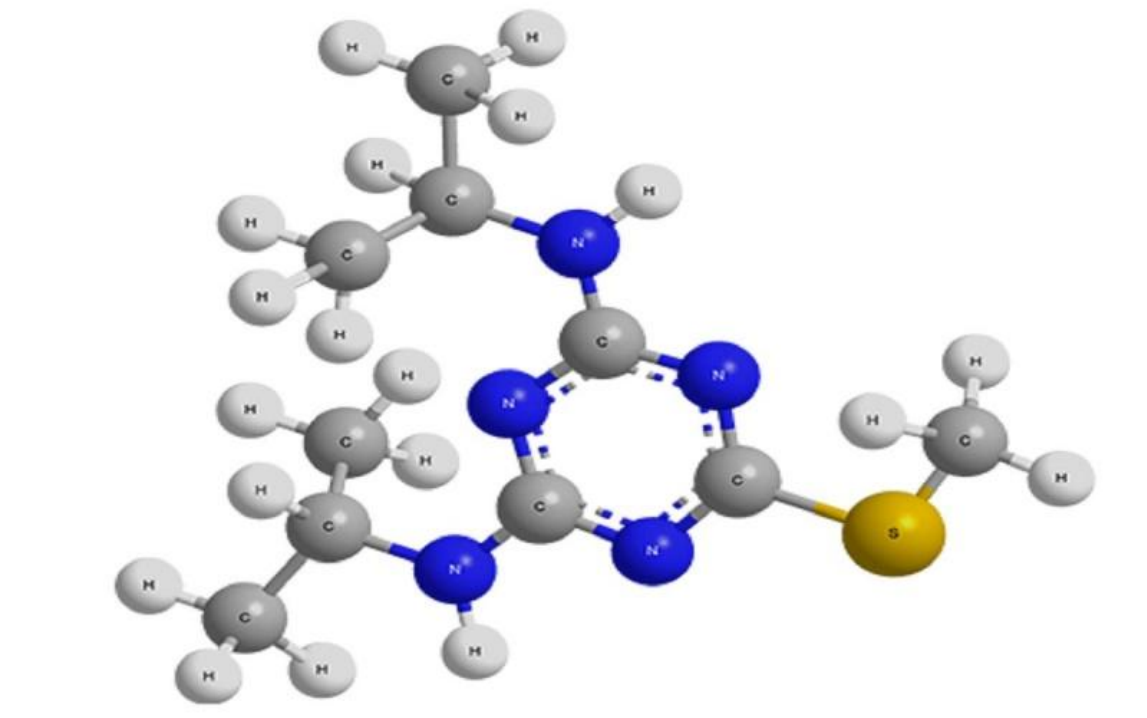
1. mining of uranium ore
2. uranium conversion
3. uranium enrichment
4. fuel assembly
5. power generation
6. spent nuclear fuel storage in the pool and reprocessing
7. low-oxide fuel production
8. spent nuclear fuel disposal





MINOR ACTINIDES: AMERICIUM, CURIUM AND NEPTUNIUM

Modifying the molecules



Molecules called triazines are capable of removing (or extracting) these harmful elements from spent nuclear fuel in a highly selective way.
The researchers changed the size of the aliphatic rings in the established benchmark molecules from 6-membered rings to 5-membered rings.

"The findings are significant as they could allow better molecules to be designed in a more rational way, rather than simply by trial and error."

Story Source

Materials provided by Northumbria University. Andrey V. Zaytsev, Rachel Bulmer, Valery N. Kozhevnikov, Mark Sims, Giuseppe Modolo, Andreas Wilden, Paul G. Waddell, Andreas Geist, Petra J. Panak, Patrik Wessling, Frank W. Lewis. Exploring the Subtle Effect of Aliphatic Ring Size on Minor Actinide-Extraction Properties and Metal Ion Speciation in Bis-1,2,4-Triazine Ligands.