FIND OUT HOW THE TSIL COMPOUND CAN HELP GENERATE NUCLEAR POWER SAFELY AND EFFICIENTLY

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ABSTRACT

The Institute of Organic Synthesis of the University of Alicante has developed a compound that allows the selective extraction of internal transition metals (lanthanides and actinides), avoiding the appearance of dangerous radioactive species.

The extracting mixture is highly efficient and selective, allowing the complete recovery of thorium with respect to uranium and other metals of the f, d and/or p blocks of the periodic table. Moreover, this mixture can be reused in new extractions without loss of effectiveness, which is a major advance in environmental protection.

This technology can be applied in areas such as nuclear chemistry, nuclear medicine and nuclear waste treatment.

Companies interested in acquiring this technology for commercial exploitation through patent licensing agreements are sought.

ADVANTAGES AND INNOVATIVE ASPECTS

ADVANTAGES OF THE TECHNOLOGY

TSIL technology has the following **advantages**:

1) It allows the **selective extraction of thorium** against other metals belonging to the f, d and/or p blocks of the periodic table, such as uranium.

2) It is **highly efficient** in the selective extraction of thorium, allowing the thorium to be recovered in its entirety with a high yield due to its high affinity.

3) **High specificity** in the extraction of thorium from uranium and other internal transition metals (lanthanides and actinides): the rest of the metals are extracted with a low or null percentage.

4) It is possible to recover at least 95% of the extractant mixture and **reuse it in further extraction cycles** of thorium versus other metals.

5) The process is **environmentally friendly**, as it avoids the appearance of dangerous radioactive species such as plutonium, thus improving safety in nuclear processes.

6) The process is carried out under **mild reaction conditions** (temperature between 0ºC-25ºC and atmospheric pressure).

7) The process is **feasible on an industrial scale** and can be adapted and implemented to the needs of the company (the TSIL compound has a synthesis yield of 89%).

In summary, the TSIL compound is a revolutionary technology that **significantly improves current thorium extraction methods** by being safer, more efficient and selective. Its application in different sectors can have a positive impact on the environment and improve **energy sustainability** worldwide.

INNOVATIVE ASPECTS OF THE TECHNOLOGY

The TSIL technology has several innovative aspects that differentiate it from other similar technologies on the market.

Firstly, the novel chemical composition of the extractant mixture allows the **selective extraction of thorium** from other metals of the f-, d- and/or p-blocks of the periodic table, **avoiding the occurrence of dangerous radioactive species such as plutonium**.

Moreover, its high efficiency allows the thorium to be **recovered in its entirety with a high yield**, and it is possible to **reuse the extracting mixture in new extraction cycles**, making it a sustainable and environmentally friendly procedure (there is no other extraction system of these characteristics on the market that is recyclable).

MARKET APPLICATIONS

The main application sectors for this novel technology are:

- **Mining and chemical industry**: the TSIL compound has applications in the selective extraction of internal transition metals (lanthanides and actinides).
- **Nuclear chemistry**: TSIL technology can be used in nuclear processes for the selective extraction of thorium from other metals, avoiding the appearance of dangerous radioactive species such as plutonium.
- **Nuclear medicine**: TSIL technology can also be applied in nuclear medicine, as it allows a selective and efficient extraction of thorium.
- **Nuclear waste treatment**: the TSIL compound also represents a considerable advantage in the treatment of nuclear waste containing thorium, as thorium can be selectively recovered.
- **Scientific research**: TSIL technology can be used in scientific research related to nuclear processes and nuclear medicine.

Its application in different sectors can have a positive impact on the environment and improve energy sustainability worldwide.

COLLABORATION SOUGHT

Companies interested in acquiring this technology for **commercial exploitation** through **patent licensing** agreements are sought.

Company profile sought:

- Nuclear industry.
- Chemical industry.
- Nuclear medicine.
- Nuclear waste treatment.