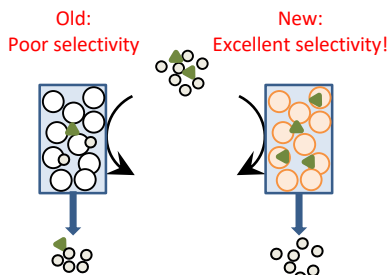


# Simple and Reliable Separations

New resin technologies to facilitate chemical separations.

## BACKGROUND & MOTIVATION

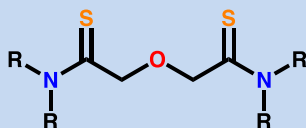


Radioisotope production, precious metal recovery, environmental remediation, and nuclear waste processing all benefit from efficient separations chemistry.

## INNOVATION

New resin designs to easily recover precious metals.

**New soft donor extractants:** very high d-block selectivity. Stable for repeated use!

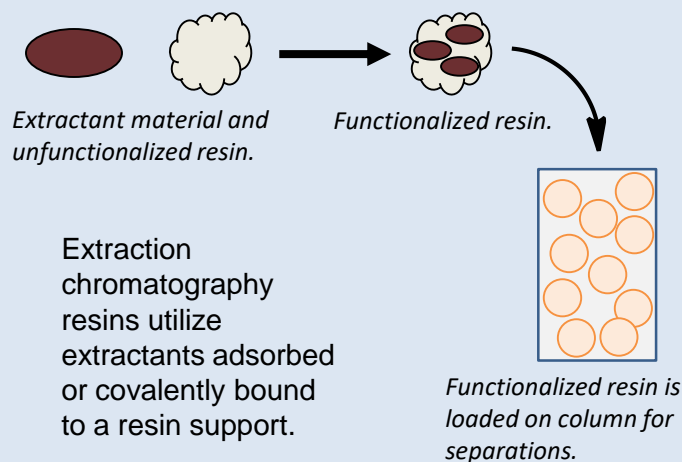


Extremely high precious metal selectivity. Recovers platinum, silver, palladium at high percentages.

Useful for commercially valuable radioisotope separations:

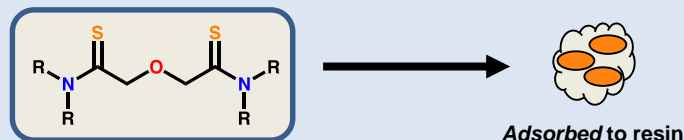
- Thorium/protactinium: promising cancer treatment!
- Niobium/zirconium: New PET agent.

## DESCRIPTION



Interactions between the extractant and target elements provide separation: wide array of potential extractant/resin combinations are possible.

## Resin design:



**New IP**

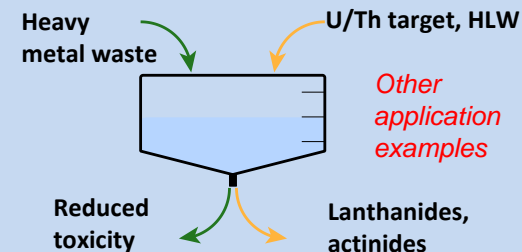
## Current Technology Readiness Level (TRL): 3

- DGTA resin synthesized and preliminary tests completed.
- Lab scale separations demonstrated.

## ANTICIPATED IMPACT

New resin designs provide novel tools to a diverse user base.

- Soft donor chemistry provide selectivity to facilitate new separations.
- High recovery of many precious metals!



## PATH FORWARD

### Optimization of conditions

- Determine substrate scope of various resins.
- Optimize loading and separation procedures (e.g. acid concentrations, co-eluents, etc.).
- Identify commercial needs. How much Pt is lost? What is the state of the art?
- Development of additional resin technologies.

### Potential End Users:

- Improved separations benefit a wide array of industrial and government users, from medical isotope production and nuclear forensics to heavy metal separations (e.g. catalyst recovery in industrial catalysis and water quality).

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