

# BAUXITE RESIDUE VALORISATION AND BEST PRACTICES CONFERENCE

Leuven

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# PRELIMINARY INVESTIGATION OF RARE EARTH SEPARATION BY TITANIUM PHOSPHATE MATERIALS

WENZHONG ZHANG, RISTO HARJULA AND RISTO KOIVULA

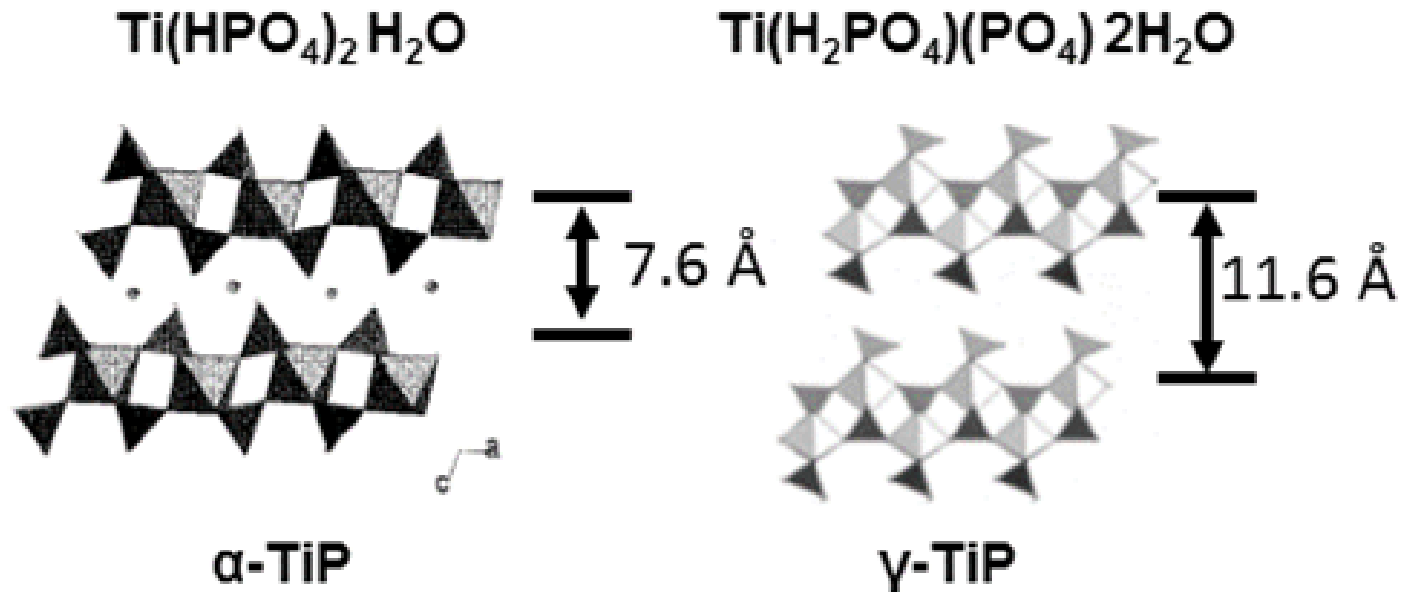
UNIVERSITY OF HELSINKI, FINLAND





# LAYERED TITANIUM PHOSPHATE MATERIALS

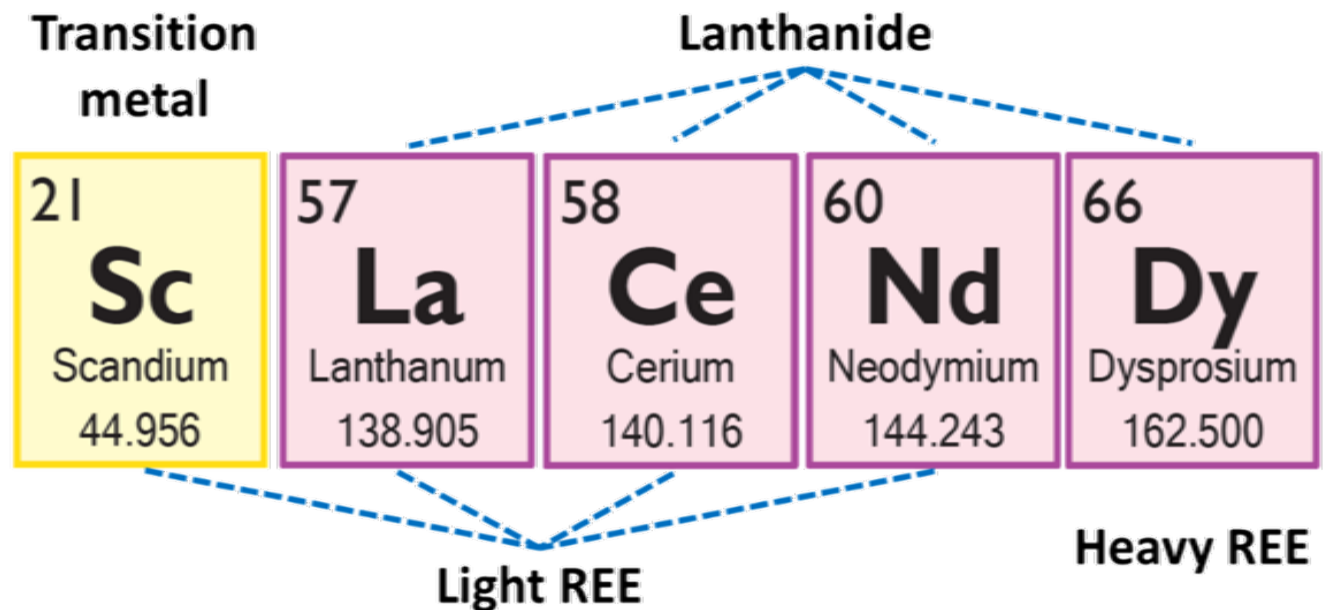
- ION EXCHANGE CAPACITY
- STRUCTURE DERIVED SELECTIVITY
- PHOSPHATE AFFINITY





# RARE EARTH ELEMENTS IN BAUXITE RESIDUE LEACHATE

- **THIS STUDY TARGETS:**





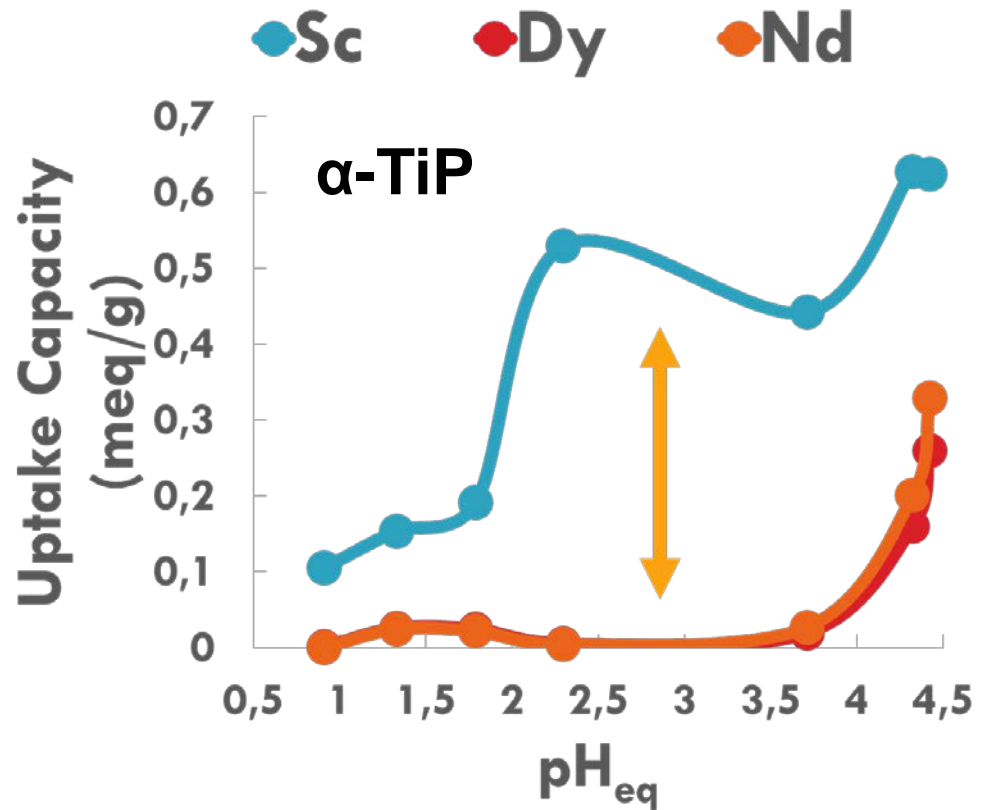
# TERNARY SYSTEM OF Sc-DY-Nd

- ALL TRIVALENT REE CATIONS
- EQUAL MOLARITY OF 1 MM
- SOLID/LIQUID RATIO: 0.1 g/20 mL
- DILUTE NITRATE AND SODIUM BACKGROUND

**HIGH UPTAKE OF Sc**

**VS.**

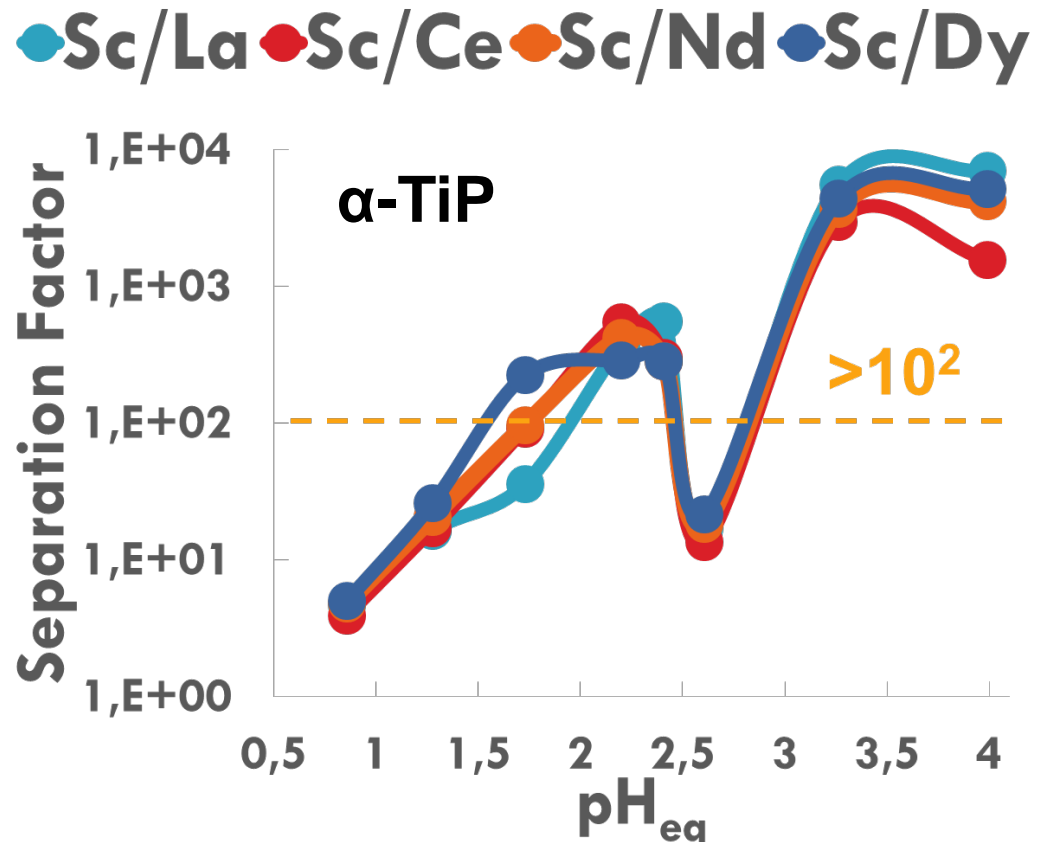
**ALMOST NO UPTAKE OF  
DY AND Nd**





# QUINARY SYSTEM OF SC-LA-CE-ND-DY

- ALL TRIVALENT REE CATIONS
- EQUAL MOLARITY OF 1 MM
- SOLID/LIQUID RATIO: 0.1 G/20 ML
- DILUTE NITRATE AND SODIUM BACKGROUND
  
- **EASY SEPARATION OF SC WITH LANTHANIDES TO BE EXPECTED**
- **SIMILAR UPTAKE BEHAVIOR AMONG LANTHANIDES**





# THANKS FOR YOUR ATTENTION!

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