INNOVATIVE SORBENTS
FOR CRM RECOVERY

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NETWORKING ON REGIONAL AND INTERNATIONAL LEVEL

EEA Topic centre on waste and material flows

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GLOBAL SCIENCE TECHNOLOGY & INNOVATION CONFERENCES

SUSTAINABLE DEVELOPMENT GOALS
Efficient and fast removal of phosphate and arsenate
- Currently pilot test at WPC De Blankaart
- ± 100 kg sorbent material
- Flow 0.2 - 1 m³/hour
- More than 95% phosphate removal

Lab based column test

5 mg L⁻¹ phosphate, Contact time < 5 minutes
INNOVATIVE CRM SORBENTS FOR HIGH ALKALINE SOLUTIONS

Ores → (Hydro)metallurgy → Slags → Alkaline leaching → Leachates pH 13.5 → Innovative sorbents

Re-use of alkaline solution → Neutralization

Leachates pH < 7 → Conventional sorbents

Steel (60%) → Super-alloys → Metal plating → Chromium

Structured clays

Polymer resins

Recovery

Vanadium

Steel (90%) → Super-alloys → Catalyst
Structured Sorbents for Recovery of Chromates

- Synthetic clay-type materials
- Improved material stability at high pH
- Wide range of chemical compositions (specific compositions patented)
- Low cost & non-toxic
- High capacity: up to 60mg/g
- Improved mass transfer
- Reduced pressure drop
- Improved/controlled selectivity
- Regenerable
Vibrational Droplet Coagulation

Various architectures

- dense
- porous
- hollow
- hollow supported
- core-shell
- gradient porosity

Wide range of materials

- Metal oxides (Al$_2$O$_3$, SiO$_2$, ZrO$_2$, ...)
- Non-oxide ceramics (Si$_3$N$_4$, SiC, ...)
- Other types (zeolites, clays, alginates, ...)

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3D printing

Direct-write

Support printing

+ functionalisation (coating or impregnation)