

### Processes for Zinc (and Cadmium)

- Zinc extraction from Rayon manufacturing effluents (*the Valberg Process*)
- Zinc extraction from used iron chloride pickling liquors (*the MeS process*)
- Zinc extraction from a pharmaceutical waste water
- Zinc extraction from a zinc plant bleed stream
- Recovery of zinc from complex ore concentrates
- Zinc and cadmium extraction from scrubber waste water

### Processes for Copper

- Copper extraction from an industrial waste water stream
- Recovery of copper from chalcopyrite concentrates
- Comparison of hydro- and pyrometallurgical processes for the production of copper
- Continuous on-line treatment of ammoniacal etch liquor and rinse water in the manufacturing of printed circuit boards in the electronics industry (*the MECER process*)
- Copper recovery from wire scrap
- Recovery of copper from Mine Waters with a SX-EW integrated process

### Processes for Copper and Zinc

- Copper and zinc extraction from mine waters
- General hydrometallurgical concept for the recovery of copper and zinc from brass and steel mill flue dust (*the H-MAR concept - Sulphuric acid route*)

### Processes for Copper, Zinc and Nickel

- General hydrometallurgical concept for the recovery of copper, zinc and nickel from metal containing galvanic sludge and flue dust (*the AmMAR concept – Ammoniacal route*)
- General pyro- and hydrometallurgical concept for the treatment of metal containing slime and flue dust (*the UddaMAR process*)

### Processes for Nickel and Cadmium or Chromium

- Recovery of nickel and cadmium from accumulator scrap and production waste (*the NIFE Process*)
- Nickel and chromium extraction from plating baths -a mobile unit for galvanic bath cleaning operation
- Purification of a cadmium electrowinning bath – nickel extraction.

### Processes for Cobalt and Nickel (Mo, W, V)

- Purification of a prim. nickel sulphate solution
- Recovery of cobalt and nickel from scrap alloy, using solvent extraction (*the Gullspang process*)
- Recovery of cobalt, nickel, molybdenum and/or tungsten from super alloy grindings
- Recovery of cobalt, nickel, molybdenum and vanadium from spent catalysts

### Processes for Molybdenum (Re)

- Molybdenum extraction from sulphuric acid solutions, production waste treatment
- Purification of molybdenum trioxide
- Recovery of molybdenum and rhenium from solid production waste

## Processes for Uranium (Mo, V)

- General solvent extraction routes for the recovery of uranium, molybdenum and vanadium from oil slate leach liquors (*the AE process, the LKS process and other process ideas*)
- Recovery of uranium from pitchblende (sulphuric acid leach solution)
- Uranium removal from phosphoric acid solutions

## Processes for Vanadium (Ti)

- Recovery of vanadium from flue ash (soot) emanating from oil burned power stations (*the SOTEX process*)
- Recovery of vanadium and nickel from ash, soot and slag
- Recovery of vanadium from LD-slag
- Recovery of vanadium and titanium from ore concentrates

## Processes for Tungsten

- General hydrometallurgical routes for the production of tungsten from scheelite minerals

## Processes for Tantalum and Niobium

- General hydrometallurgical routes for the production of tantalum and niobium

## Processes for Rare Earth (incl. Y and Sc)

- General solvent extraction routes for the production of a rare earth concentrate from an apatite leach liquor
- General solvent extraction routes for the production of a rare earth concentrate from a phosphoric acid bleed stream
- Processes for recovering rare earth elements from various ores and secondary waste (European Commission projects)
- Recovery of Rare Earth Elements and Scandium from Red and Grey Mud (Alumina Production Waste)
- Recovery of Rare Earth Elements and Scandium from European Deposits by Solvent Extraction
- Recovery of Scandium from Bauxite Residue by Selective Precipitation from Leach Solution

## Processes for Aluminium

- General solvent extraction routes for the production of alumina from muscovite concentrates
- Alumina extraction from a citric acid solution

## Processes for Extraction of Acids

- Production of food-grade phosphoric acid (*the SAEC process*)
- Recycling of HF-HNO<sub>3</sub> pickling acids in the stainless steel production (*the AX process*)
- Cleaning zinc discard electrolyte from chloride and fluoride ions (*HCl+HF extraction*)
- Recycling of a H<sub>3</sub>PO<sub>4</sub> electrolyte in electro polishing operation (*the ELPOL process*)
- Phosphorus recovery from sewage sludge ash by a wet-chemical process (*the CleanMAP process*)
- Processes for recovering phosphate from sewage sludge ash (*The PASH process*)

## Miscellaneous

- Extraction of organic hydro carbon solvents from sea water (*the Mongstad process*)
  - Surfactants in solvent extraction systems - practical use for crud elimination
  - Extraction of organic solvents and lubricants (*the Skultuna process*)
  - Separation and purification of base metals from bio-leach solutions by solvent extraction
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