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Development of Advanced Ion Exchange Materials and Methods for the Removal of Toxic Metals from Metallurgical Waste Effluents

Fact Sheet

Project Information

Grant agreement ID: BRPR960158

Project closed

Start date
1 May 1996

End date
30 April 1999

Funded under
Specific research and technological development programme in the field of industrial and materials technologies, 1994-1998

Total cost
No data

EU contribution
No data

Coordinated by
University of Helsinki
Finland

Objective

Adsorption and ion exchange materials have been identified, evaluated and tested for the removal of trace toxic metals arising in the metallurgical industries. A study of treatment and recovery processes in the metal plating industry has revealed

considerable scope for ion exchange treatment in certain process applications.

The technical achievements are summarised as follows:

-- evaluation of existing commerically available adsorbents products and/or modification of commercially available products

-- development of new and/or improved sorbents

-- characterisation of physical, chemical and ion exchange properties of the most suitable adsorbents/ion exchangers for the treatment of metal plating solutions

-- correlation and prediction of adsorption/ion exchange equilibria using established theory

-- development of new technologies, e.g. parametric pumping, for the separation and recovery of valuable metals

-- testing of sorbents under actual operting conditions. for recovery/recycle of metals from spent metal plating baths, rinse water and waste-waters

-- simulation of adsorptive separation processes.

Objectives and content

Metallurgical industries produce large amounts of metal-bearing waste effluents which have to be properly decontaminated and/or purified. Conventional waste treatment methods do not always fulfil the present regulations of environmental discharges. In this research, advanced ion exchange and adsorbent materials and processing methods will be studied for the effective low cost removal of toxic metals from these effluents. This research will be valuable in developing generic processes for the decontamination of waste effluents and recycling of metals.

A wide variety of ion exchange and adsorbent materials will be evaluated. These include organic ion exchange resins, especially chelating exchangers, inorganic ion exchangers, specialty adsorbent materials such as processed sea weed residue and activated carbons. The research will cover the synthesis, physical characterization, fundamental ion exchange properties, mathematical modelling of ion exchange equilibria and kinetics as well as the testing of performance with real waste solutions and development of new ion exchange technology for large-scale exploitation.

Fields of science (EuroSciVoc)

engineering and technology > environmental engineering > waste management > waste treatment processes > **recycling**

engineering and technology > environmental engineering > water treatment processes > **wastewater treatment processes**

natural sciences > mathematics > applied mathematics > **mathematical model**

Programme(s)

FP4-BRITE/EURAM 3 - Specific research and technological development programme in the field of industrial and materials technologies, 1994-1998

Topic(s)

0102 - Development of clean production technologies

Call for proposal

Data not available

Funding Scheme

CSC - Cost-sharing contracts

Coordinator

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EU contribution

No data

Total cost

No data

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Total cost

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