

KEYWORDS: electronic waste recycling, refractory metals selective extraction, Tantalum recycling from WEEE, Tungsten

BACKGROUND

Tantalum is highly in demand in today's advanced technologies, however the remaining natural resources are scarce (less than 50 years consumption), so alternative sources such as recycling are of great interest. Moreover, Ta is usually present under an oxidized form and consequently at relatively low concentration, resulting in considerable production losses. Last of all, "traditional" Ta extraction process is extremely energy-consuming and involves the use of toxic reagents with highly negative environmental impact.

DESCRIPTION

The invention consists in environment friendly processes for selectively extracting refractory metals such as Tantalum, Tungsten, Niobium, Molybdenum and Vanadium from a solid material comprising the metallic constituent in an oxidized form. The process is based on ion exchange mechanisms using low alkalinities aqueous solutions including layered double hydroxides. It enables highly efficient selective extraction from low concentration ores and WEEE without using concentrated mineral acid.

COMPETITIVE ADVANTAGES

- Hydrofluoric acid and organic solvent free
- Highly efficient selective extraction
- Enables recycling of low concentrated and electronic waste
- Sustainable process, free of radioactive elements



PRINCIPAL MARKET

- Electronic components
- Orthopedic implant super-alloys
- Waste Electrical and Electronic Equipment recycling
- Low concentration ore extraction



FIELDS OF APPLICATION

- Refractory metal extraction
- Tantalum extraction from low-grade ores and from WEEE



INVENTORS

Grégory LEFEVRE et Thomas DEGABRIEL



LABORATORY

Institut de recherche de chimie-Paris, MIM2 team.
ENSCP-PSL, CNRS



INTELLECTUAL PROPERTY

Patent family FR1908467,
PCT/FR2020/051326

CONTACT



psl.valo@psl.eu