center for technology transfer and innovation
at the Jožef Stefan Institute

Jožef Stefan Institute, Ljubljana, Slovenia

Method for the synthesis of metal molybdates and tungstates from molybdenum and tungsten carbides and nitrides

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The Jožef Stefan Institute has developed a method for the synthesis of metal molybdates and tungstates from molybdenum and tungsten carbides and nitrides. The main advantage of the process is that the conversion takes place at low temperatures compared to currently used techniques that require high temperatures and sharp reaction conditions. Metal molybdates and tungstates are used in several areas, for example, catalysis, moisture sensors, for scintillation detectors, optical fibres and solid-state lasers, etc. Partners for further development are sought.

Metal molybdates and tungstates are used in several areas, for example, catalysis, moisture sensors, for scintillation detectors, optical fibres and solid-state lasers, etc. The very exposed use case is the removal of lead from drinking water.
The Jožef Stefan Institute with this invention presents a method for synthesis of metal molybdates and metal tungstates from molybdenum and tungsten carbides and nitrides. The conversion is done in the presence of a water solution of metal-containing reactive compounds. The main advantage of this process is that the conversion takes place at low temperatures while currently, most syntheses of molybdates and tungstates require high temperatures and sharp reaction conditions, such as solid reactions.
To commercialize the technology further development is needed. The offered method is at the proof of concept level. Raw materials processing and final product need to be developed for the demonstration. The technology described is a replacement of the existing processes with a simpler and less expensive solution.

Advantages

The main advantage and innovation of this method is in that it allows the synthesis of large amounts of metal molybdates and tungstates:
- at low temperature, and
- using reactive compounds dissolved in water.

Stage of development

Under development/lab tested

Intellectual property

Slovenian patent granted, European patent application filed

Contact details

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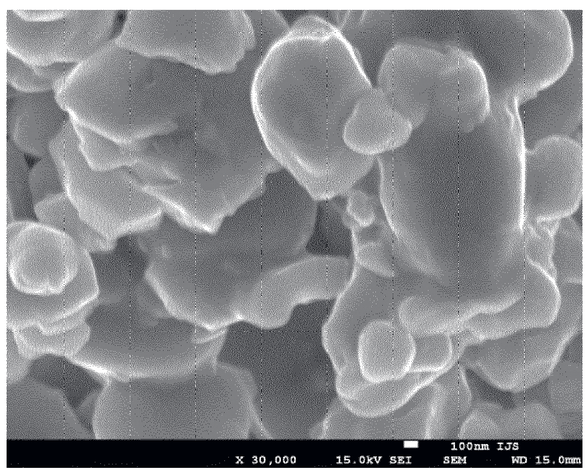

Figure 1: Image of the starting material Mo_2C (Aldrich) applied to the carbon strip.

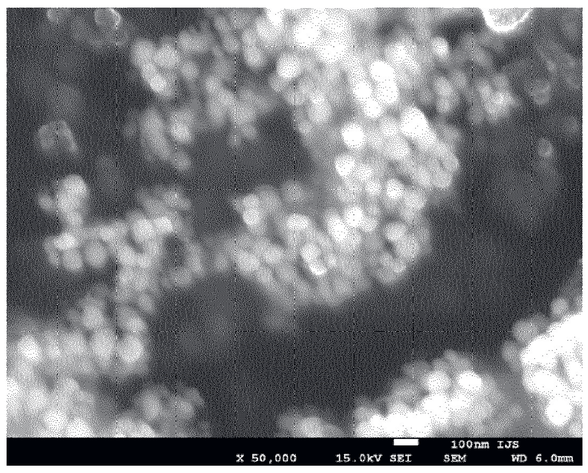

Figure 2: The resulting $PbMoO_4$ crystals deposited on the carbon strip.

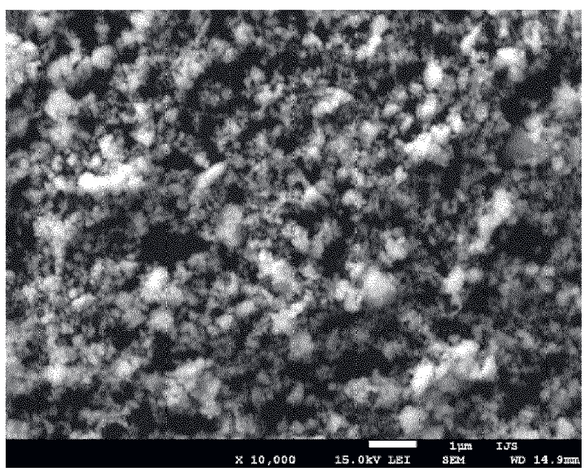

Figure 3: FE-SEM image of the starting material W_2N deposited on the carbon strip.

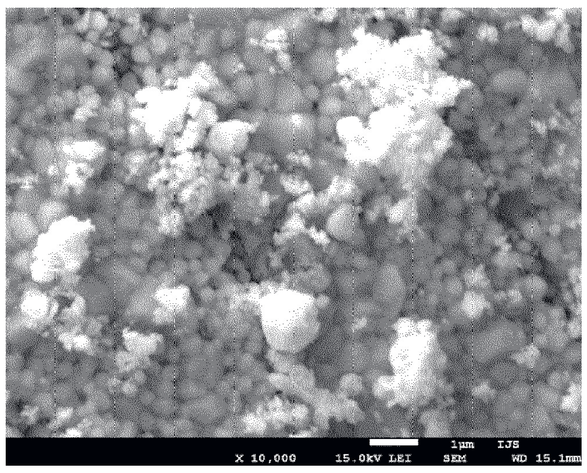

Figure 4: The resulting $PbWO_4$ crystals deposited on the carbon strip.

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