Job offer

Valorization of Phosphogypsum – Phosphogypsum Processing to Critical Raw Materials

Position :

18 months post-doctoral position

Description of the Laboratory :

Mines Saint-Etienne (MSE), one of the graduate schools of Institut Mines Télécom, the #1 group of graduate schools of engineering and management in France under the supervision of the Ministry of the Economy, Industry and Digital Technology, is assigned missions of education, research and innovation, transfer to industry and scientific, technological and industrial culture. MSE consists of 2,400 graduate and postgraduate students, 450 staff, a consolidated budget of €50M, three sites on the Saint-Etienne campus (Auvergne Rhone-Alpes region, Lyon Saint-Etienne metropolitan area), a campus in Gardanne (Provence Alpes Côte d'Azur region, Aix Marseille metropolitan area), six research units, five teaching and research centres and one of the leading French science technology and industrial culture community centres (La Rotonde > 40,000 visitors). It has development projects in Lyon, including the digital campus of Auvergne Rhone-Alpes region. For 2021, MSE was ranked 300-400 worldwide in Engineering and Technology by the Time Higher Education World University Ranking (#6 graduate school of engineering in France and #1 institution in both of its regions) and was also ranked in Computer Science (501-600) and Physical sciences (601-800). Its work environment is characterised by high Faculty-to-Student, Staff-to-Faculty and PhD-to-Faculty ratios, as well as comprehensive state-of-the-art experimental and computational facilities for research, teaching and transfer to industry.

« Sciences of Industrial and Natural Processes » (SPIN), is a centre for Formation, Reasearch and Technology Transfer reknowned for its expertise in the field of Process Engineering applied to divided solids (grains, particles, powders, soils, ores) working on innovation for industrial companies facing digital and environmental transition. SPIN Center is composed of three departments. Techniques of characterization are aggregated into experimental platforms (characterization of solids, characterization of liquids). Technological developments are operated on two physical platforms, a first one dedicated to chemical sensors and instrumentation and a second one dedicated to powder technology (synthesis and transformation of powders). A digital platform is dedicated to digital twins.

Description of the work :

This post-doctoral study is a part of a whole european program which objective is the recovery of rare earth elements in phosphogypsum, which is a by-product of fertilizer production. The candidate will have to develop and use experimental techniques (instrumented reactors) in order to study and optimize a patented chemical treatment process of phosphogypsum.

The work program includes :

- Conception and installation of instrumented chemical reactors that will be used for the treatment of phosphogypsum.
- Chemical characterization of phosphogypsum.
- Phosphogypsum chemical treatment for the recovery of rare earth elements.
- Characterization of rare earth elements solutions obtained.
- Further treatment of phosphogypsum after recovery of rare earth elements to make them recoverable for construction or agriculture.

The candidate will adopt a truly multidisciplinary approach while having good autonomy and a real motivation for research.

The research will be realized by a research team of SPIN Center under scientific supervision of M. Essaïd BILAL and M. Philippe GROSSEAU of SPIN Center.

The position is located at Saint-Étienne (France).

Profile of the candidate :

PhD in chemical engineering, physical chemistry or inorganic chemistry.

Expected skills

- Aptitude for experimental laboratory work
- Chemistry and chemical processes
- Good knowledge of chemical analyses techniques
- Fluent english

Know-how :

- In-depth knowledge of mineral chemistry.
- General knowledge in chemical engineering.
- Mastering of certain chemical analysis techniques (ICP, X-Ray Fluorescence…).
- Take into account the validity and the limits of the analysis method used.
- Apply a quality approach in the production of results.

Qualities :

- Scientific rigor
- Intellectual curiosity
- Team spirit and good communication
- Adaptability
- Autonomy
- Source of proposals

How to candidate

Interested candidates should submit a CV, a cover letter describing their research experience and interests, and the names and email addresses of references before 31-03-2022 to bilal@emse.fr or grosseau@emse.fr

Contacts :

Professional informations

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Administrative informations

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