

**TITLE:** TECHNOLOGICAL ROADMAP: MICROBIAL BIOLEACHING OF METALS FROM SPENT CATALYSTS OF THE PETROLEUM REFINING HYDROTREATMENT STAGE

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**ABSTRACT:**

In petroleum refineries, hydrotreatment is an important stage, that aims at the reduction of nitrogen and sulphurates compounds and metals, present in crude oil. In this process, catalysts (HDT catalysts) are used, which intensify and accelerate the treatment. HDT catalysts have a lifespan and, at the end of this, are usually discarded. To minimize the environmental impacts caused by these wastes and make it possible to reuse the catalysts and the metals present in them, the bioleaching process can be applied. Bioleaching consists of the solubilization of metals, from metabolites produced by chemoautotrophic and acidophiles microorganisms. This work aimed at the elaboration of a technological map linked to the theme "Bioleaching of metals from catalysts of the petroleum refining hydrotreatment stage". Initially, a pre-prospective phase was carried out, with a bibliographic search about the subject. The prospective phase consisted in the search of articles, granted patents and requested patents. Were made macro, meso and micro analyzes of each selected document. With the analysis, it was possible to know the tendency of publications, as well as the granting and request of patents by the world. The results showed that the proposed theme is not very studied, with a limited number of publications. In addition, the tendency of using acidophilic and mesophilic bacteria was observed. With regard to patents, no document was found on the proposed topic. Thus, patents with the general theme of "Bioleaching" were used. A tendency was found in the use of acidophilic, thermophilic microorganisms and indigenous microbial consortia from the mining industry waste. This difference of microbial groups may be related to the scale of the process, as well as the origin of the waste. It was possible then to draw up a technological map, which allowed for the inference of applications in the short, medium and long times, about bioleaching process, with prevalence of applications in long time. Depending on the companies profile, it was possible to suppose those with potential interest in investing in the bioleaching of metals in HDT catalysts. This work allowed the recognition of the importance of carrying out the technological prospection to initiate a scientific research, resulting in a more critical view of the subject. In addition, it was possible to identify a demand for the bioleaching process.

**Keywords:** Bioleaching of metals; HDT spent catalyst; technological prospection; technological roadmap