

TITLE: TECHNOLOGICAL MAP OF THE MICROBIAL PROCESS APPLIED TO HEAVY METAL BIOREMEDIATION

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ABSTRACT:

The improper disposal of industrial waste or environmental accidents from mining activities is, nowadays, one of the most important problems of environmental pollution. The heavy metals are very reactive and toxic, accumulating through trophic chain (bio magnification) and representing a risk to public and environment health. Searching for technologies to reduce the impact of areas contaminated by heavy metals, stands out the bioremediation, which is a low cost technology that use microorganisms (fungi and bacteria), as bioremediation agents. This study aimed to map the technological development of microbial processes used to decontamination of areas contaminated by heavy metals. The scope of patent search was built from association of keywords (bioremed* and heavy metals and microorganism*), using the base of the title or abstract using the codes of International Patent Classification (IPC), referring to treatment of water, waste water, sewage, or sludge (C02F3/34) an heavy metal compounds (C02F1/62), in the period of 1973 to 2015. The chosen data basis was the Espacenet[®]. On this search, 222 patents were selected. The association with the largest number of selected patents was “microorganism* and heavy metals”. The bioremediation of heavy metals presented an accentuated increase in the last five years. The bioaccumulation process is the most used (141 patents) and China is the country with the higher number of patents deposition, being the propellant of new technology and research in the area of bioremediation of heavy metals. The Institutions of Superior Education and Research Centers are demonstrating a fundamental role in the development of bioremediation problems, in which the professors/researchers and students are the protagonists. Thus, it is evident that the bioremediation technique is rising, becoming an interesting tool to the treatment of contaminated environments by heavy metals.

Keywords: bioremediation, heavy metals, microorganisms, prospection, technology