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ABSTRACT

In bioleaching processes using autotrophic bacteria, CO_2 is the carbon source for the growth of the microorganisms and its availability is dependent on gas mass transfer in the bioreactor. In this study the demand in CO_2 was investigated during bioleaching of several sulfidic materials (pyritic tailings, Cu concentrate, coal waste) in STR using the "BRGM-KCC" bacterial consortium. The results show (i) that Fe oxidation (and thus microbial activity) is delayed when air is injected without CO_2-supplementation, and (ii) that CO_2-supplementation improves leaching kinetics. The study proposes also a methodology to determine G/L transfer components and to asses CO_2 limitations in the system. It shows that the microorganisms are not only sensitive to the transfer rate of CO_2 from the gas to the liquid phase, but also to the availability of CO_2 in solution.

Key-words: bioleaching, carbon dioxide, CO_2-supplementation, mass transfer, sulphide