

INTISARI

*BIOLEACHING ASAM MOLIBDAT MENGGUNAKAN ASAM ORGANIK YANG DIHASILKAN OLEH JAMUR *Aspergillus niger**

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Molibdenum (Mo) umumnya digunakan sebagai katalis logam untuk keperluan industri. Karena toksisitasnya, katalis Mo perlu dikelola dengan baik ketika sudah tidak digunakan lagi. Metode yang relatif murah dan ramah lingkungan untuk mengolah katalis Mo yang digunakan adalah *bioleaching*. Beberapa asam organik yang dihasilkan oleh mikroorganisme telah diketahui mampu melarutkan katalis logam. Penelitian ini bertujuan untuk mendapatkan strain jamur *Aspergillus niger* dan medium fermentasi alternatif untuk menghasilkan asam organik yang digunakan untuk melarutkan asam molibdat melalui proses *bioleaching*. Beberapa strain *Aspergillus niger* (Koleksi Laboratorium Mikrobiologi Pertanian) diperiksa kemampuannya untuk menghasilkan asam organik. Langkah selanjutnya, beberapa medium fermentasi alternatif untuk produksi asam organik juga diuji. Produksi asam organik total dianalisis dengan metode titrasi, sedangkan kadar asam sitrat dianalisis dengan *High-Performance Liquid Chromatography*. Molibdenum terlarut dianalisis dengan *Optical Emission Spectroscopy*. Hasil penelitian menunjukkan bahwa produksi asam organik optimum diperoleh *Aspergillus niger* strain PI pada medium fermentasi KMI dan OMI. Produksi asam sitrat tertinggi berturut-turut adalah 837.25 µg/l dan 648.96 µg/l untuk KMI dan OMI yang tercapai pada hari ke-20 fermentasi. Medium KMI dan OMI juga menunjukkan efektivitas pelindian yang lebih tinggi sebesar 32.37% dan 31.50% dibandingkan dengan medium kontrol, KMK dan OMK.

Kata kunci: *bioleaching*, molibdenum, *Aspergillus niger*, asam sitrat

ABSTRACT

MOLIBDIC ACID BIOLEACHING USING ORGANIC ACID

PRODUCED BY *Aspergillus niger*

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Molybdenum (Mo) is commonly used as a metal catalyst for industrial purposes. Because of its toxicity, it is necessary to manage properly the Mo catalyst, when it is no longer reused. The relatively inexpensive method and environmentally friendly to treat the used Mo catalyst is bioleaching. Several organic acids that are produced by microorganisms have been known to be able to solubilize metal-bound organic substances such as a metal catalyst. Therefore, the objectives of this work were to obtain *Aspergillus niger* producing organic acid and alternative fermentation media for organic acid production. Several strains of *Aspergillus niger* (Laboratory of Agricultural Microbiology collections) were examined for their ability to produce organic acids. Several alternative fermentation media for organic acid production were also tested. The total organic acids production was analyzed by titration method, while the citric acid content was analyzed by High-Performance Liquid Chromatography. The dissolved molybdenum was analyzed by Optical Emission Spectroscopy. The results showed that the optimum production of organic acid production was obtained by *Aspergillus niger* strain PI in medium fermentation of KMI and OMI. The highest citric acid productions were 837.25 µg/l and 648.96 µg/l for KMI and OMI, respectively. Those were reached on the 20th day of fermentation. The media of KMI and OMI also showed higher leaching effectivity by 32.37% and 31.50%, respectively compared to control media, KMK and OMK.

Keywords: bioleaching, molybdenum, *Aspergillus niger*, citric acid