Pengembangan proses biomachining multi-axis dengan bakteri acidithiobacillus ferrooxidans NBRC 14262 dan analisis pengaruh inklinasi benda kerja dalam cairan medium kultur = development of multi-axis biomachining using acidithiobacillus ferrooxidans NBRC 14262 and analysis of the influence of inclination to the workpiece in cultured medium

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Abstrak

[ABSTRAK
Beberapa penelitian telah menunjukkan bahwa bakteri mampu melakukan pemesinan pada logam, salah satunya adalah Acidithiobacillus ferrooxidans. Keuntungan utama menggunakan bakteri untuk proses pemesinan adalah efisiensi energi yang digunakan. Penelitian sebelumnya telah membuktikan kemampuan Acidithiobacillus ferrooxidans dalam melakukan pemesinan termasuk karakterisasi pelepasan material dan hasil akhir pada benda kerja. Namun tidak satupun dari penelitian tersebut yang meneliti kemungkinan dari bakteri tersebut
melakukan pemesinan multi-axis. Dalam penelitian ini akan dibahas mengenai kemungkinan dari Acidithiobacillus ferrooxidans dalam melakukan pemesinan
multi axis dengan menggunakan total 15 buah sampel benda kerja. Beberapa benda kerja tersebut diletakkan dalam cairan medium kultur dengan diberikan
sudut inklinasi 450 dengan menggunakan inklinator untuk membandingkan hasil pemesinan dengan benda kerja yang tidak diberi inklinasi. Hasil dari mikrografi
SEM menunjukkan bahwa benda kerja yang diberi inklinasi memiliki kedalaman pelepasan material dan profil potongan yang berbeda dengan benda kerja yang
tidak diberi inklinasi. Benda kerja yang diberi inklinasi memiliki perbedaan kedalaman pelepasan material sebesar 45% lebih banyak pada sisi yang lebih
tinggi. Dengan adanya perbedaan karakteritik pemesinan, diharapkan dapat dijadikan acuan untuk pengembangan proses Biomachining multi-axis lebih
lanjut.
ABSTRAK
Recent studies show that some bacteria have the ability to do machining process, and one of them is Acidithiobacillus ferrooxidans. The main purpose of
using bacteria to do the machining process is the efficiency of energy used.
Previous studies have already investigate the capability of Acidithiobacillus
ferrooxidans to do the machining including the characterization of the material
removed and surface finishing of the workpiece. However, none of them
investigate the possibility for the bacteria to do the multi-axis machining. In this
research, the capability of Acidithiobacillus ferrooxidans to do the machining
process was investigated. A total of 15 workpieces were used, and placed in the
cultured medium with different conditions. Some of the workpieces were placed

without inclination angle while some of them were placed with 450 of inclination angle. The SEM micrograph result showed that there were differences in the cutting depth and cutting profile of the workpieces which were inclined and not inclined. The higher sides have 45% more depth of material removed. According to these result, there is a possibility it might led to the further development of multi-axis Biomachining., Recent studies show that some bacteria have the ability to do machining process, and one of them is Acidithiobacillus ferrooxidans. The main purpose of using bacteria to do the machining process is the efficiency of energy used. Previous studies have already investigate the capability of Acidithiobacillus ferrooxidans to do the machining including the characterization of the material removed and surface finishing of the workpiece. However, none of them investigate the possibility for the bacteria to do the multi-axis machining. In this research, the capability of Acidithiobacillus ferrooxidans to do the machining process was investigated. A total of 15 workpieces were used, and placed in the cultured medium with different conditions. Some of the workpieces were placed without inclination angle while some of them were placed with 450 of inclination angle. The SEM micrograph result showed that there were differences in the cutting depth and cutting profile of the workpieces which were inclined and not inclined. The higher sides have 45% more depth of material removed. According to these result, there is a possibility it might led to the further development of multi-axis Biomachining.]