Penggunaan Bakteri Golongan Bacilla Sebagai Media Dalam Meningkatkan Kuat Geser Tanah Pasir = The Use Of Bacteria Genus Bacilla As The Media To Increase The Shear Strength Of Sand

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Abstrak

Proses bio-sementasi atau yang biasa dikenal dengan MICP (Microbial Induced Calcite Precipitation) pada tanah sangat dipengaruhi oleh aktivitas enzim urease. Aktivitas urease yang tinggi, presipitasi urea dan kalsium klorida menjadi partikel kalsit juga akan meningkat. Enzim urease diperoleh dari B.subtilis dan Oceanobacillus sp. dengan nomor isolat P3BG41 dan P3BG43. Bakteri ditumbuhkan di bawah media B4 urine dan M63 dengan asam glutamat pada suhu 37oC dan pH +7 selama lima hari pengamatan. Isolat kemudian diukur harian kepadatan optik dan aktivitas urease. Bakteri dan kombinasi urea (CO(NH2)2) dan kalsium klorida (CaCl2) disuntikkan setiap hari ke dalam pasir untuk mendapatkan hasil optimum dari presipitasi kalsit. Nilai tertinggi aktivitas enzim urease terjadi pada hari kedua inkubasi. Sementara kepadatan optik berkurang pada hari kedua, kohesi tanah mencapai nilai tertinggi pada hari itu. Namun, nilai sudut gesekan pada hari kedua memiliki titik terendah dibandingkan dengan hari lainnya.
.....Bio-cementation process or commonly known as MICP (Microbial Induced Calcite Precipitation) on soil is strongly influenced by urease enzyme activity. High of urease activity the precipitation of urea and calcium chloride into calcite particles will also increase. The urease enzyme is obtained from B.subtilis and Oceanobacillus sp. with isolat number P3BG41 and P3BG43. The bacteria were grown under B4 urine medium and medium M63 with glutamic acid at 37oC and pH +7 for five days observation. The isolats were then daily measured its optical density and urease activity. The bacteria and combination of urea (CO(NH2)2) and calcium chloride (CaCl2) were daily injected into the sand to obtain the optimum results from the calcite precipitation. The highest value of urease enzyme activity occurs on the second day incubation. While the optical density was reduced on the second day, the soil cohesion reaches the highest value at that day. However, the friction angle value on the second day has the lowest point compared to the other day.