Biosorpsi gas dinitrogen monoksida dalam proses biofiltrasi menggunakan medium kompos berbasis kotoran sapi = Nitrous oxide biosorption in biofiltration process using cow-manure compost based medium

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Abstrak

Penelitian biofilter skala laboratorium dilaksanakan dengan tujuan untuk mengevalusi pengaruh laju alir dan kedalaman medium filter terhadap efisiensi reduksi N2O dan pertumbuhan mikroorganisme di dalam kompos. Selain itu, perubahan sifat medium yang terjadi sebelum dan setelah biofiltrasi serta karakteristik dari medium filter yang digunakan yaitu kompos berbasis kotoran sapi dan bulking agent berupa sekam dan cocopeat juga akan diteliti. Penelitian dilakukan dengan sistem aliran batch selama 9 jam.
Hasil penelitian menunjukkan efisiensi reduksi N2O terbaik didapatkan pada laju alir 88 cc/menit dengan kedalaman 50 cm sebesar 61,35%, dan kapasitas eliminasi yang diperoleh sebesar 14078 g/m3h. Hasil kualitatif mikroorganisme di dalam kompos diamati dengan menggunakan SEM dan diketahui bahwa kompos awal sebelum biofiltrasi mengandung lebih sedikit mikroorganisme dibandingkan kompos setelah biofiltrasi.
.....A laboratory-scale biofilter was used to evaluate the effects of flow rate and depth of the filter medium on the removal efficiency of N2O and the growth of microorganisms in the compost. Properties of the medium before and after biofiltration and characteristics of the filter medium will also be examined. The biofilter was operated using cow manure compost based medium with husk and cocopeat as bulking agent. Research was carried out by batch flow system for 9 hours.
The result indicates that the highest N2O removal efficiency is obtained under flow rate of 88 cc/minutes with a depth of 50 cm by 61,35%, and elimination capacity for 14078 g/m3h was achieved. Qualitative result of microorganisms in the compost was observed by using SEM and note that the initial compost before biofiltration contains less microorganisms than compost after biofiltration.