Degradasi air lindi menggunakan reaktor plasma dielectric barrier discharge (DBD) nanobubble dengan oksigen sebagai reaktan = Leachate degradation using nanobubble dielectric Barrier discharge (DBD) plasma reaktor with oxygen as reactant

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Abstrak

Air lindi merupakan air yang telah melalui tumpukan sampah sehingga berpotensi untuk merusak lingkungan dan menimbulkan penyakit. Lindi dapat diolah menggunakan teknik Advanced Oxidation Processes (AOPs) berbasis ozon yang digenerasikan dengan Sistem Reaktor Plasma Dielectric Barrier Discharge (DBD) Ozon Nanobubble dengan umpan gas oksigen. Ozon dan spesies reaktif lainnya berperan untuk mengoksidasi air lindi sehingga dapat menurunkan konsentrasi Chemical Oxygen Demand (COD), Biology Oxygen Demand (BOD), Total Suspended Solid (TSS), Total Dissolved Solid (TDS), dan nitrat (NO3-), serta menetralisir pH larutan yang akan menjadi parameter penelitian. Penelitian dilakukan dengan lindi yang diambil di TPST Bantar Gebang dan diberi pre-treatment koagulasi menggunakan tawas dan filtrasi menggunakan karbon aktif. Penelitian dilakukan selama 60 menit dengan variasi laju alir, tegangan listrik, dan durasi uji. Hasil terbaik yang didapat dari masing- masing parameter percobaan adalah pH dengan penurunan 21,8%, TSS dengan degradasi 100%, TDS dengan kenaikan 514,4%, COD dengan penurunan 91,7%, nitrat dengan penurunan 78,8%, dan BOD dengan penurunan 75,1%.
.....Leachate is water that has gone through a pile of garbage so it has the potential to damage the environment and cause disease. Leachate can be processed using the Advanced Oxidation Processes (AOPs) technique with the basis of ozonation generated by the Ozon Nanobubble Dielectric Barrier Discharge (DBD) Plasma Reaktor System with oxygen gas feed. Ozon and other reactive species play a role in oxidizing leachate so that it can reduce the concentrations of Chemical Oxygen Demand (COD), Biological Oxygen Demand (BOD), Total Suspended Solid (TSS), Total Dissolved Solid (TDS), and nitrate (NO3-), as well as neutralize the pH of the solution which will be the research parameter. This research was carried out with leachate taken at the Bantar Gebang TPST and pre-treated with coagulation using alum and filtration using activated carbon. The research was conducted for 60 minutes with variations in flow rate, voltage, and test duration. The best results obtained from each experimental parameter were pH with 21,8% decrease, TSS with 100% degradation, TDS with 514,4% increase, COD with 91,7% decrease, nitrate with 78,8% decrease, and BOD with a decrease of 75.1%.