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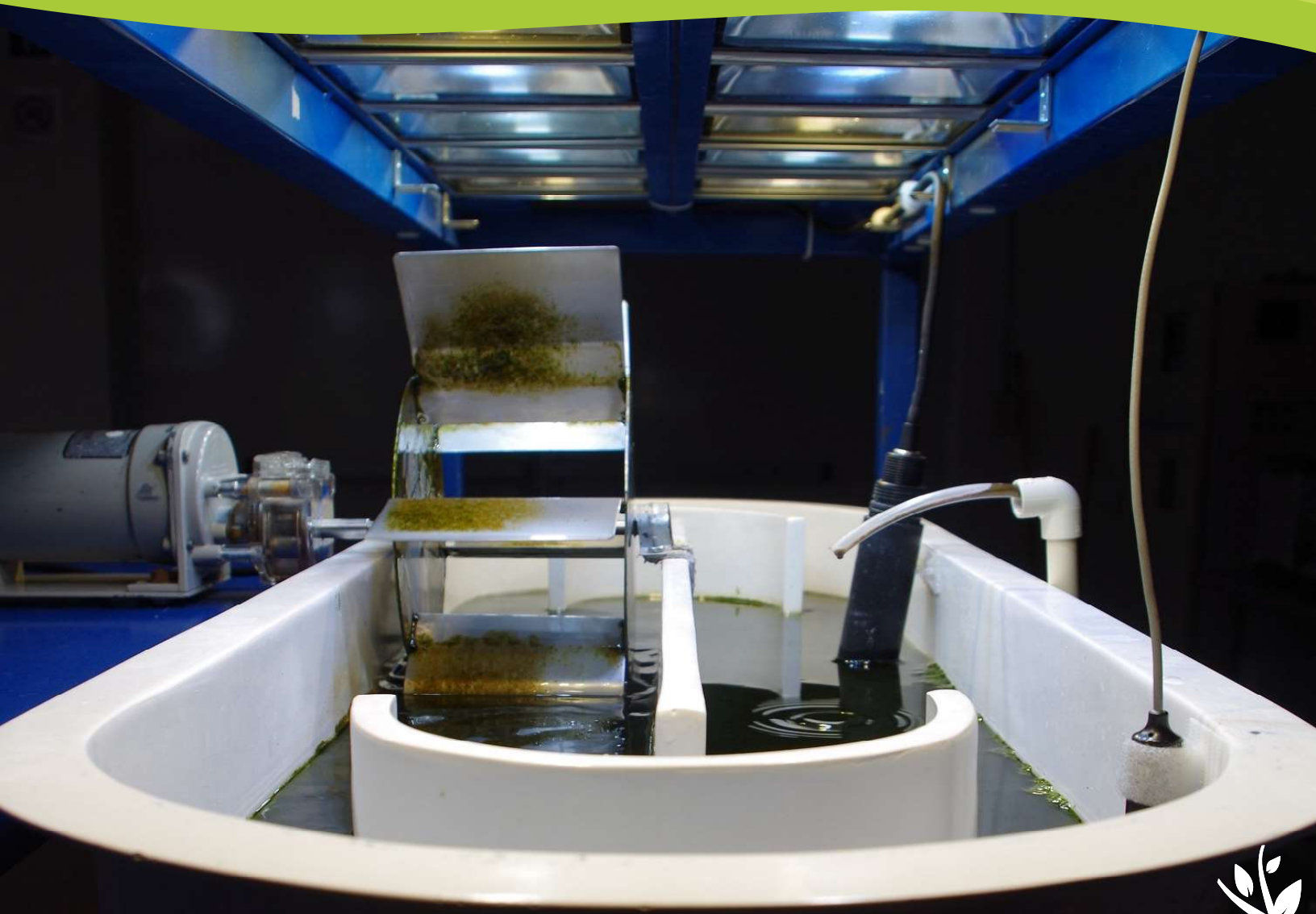

Foto: Fotobiorreactor de microalgas, tratamiento de aguas residuales
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Cada edición muestra los trabajos que derivan del arbitraje académico estricto de carácter internacional. También se publican números especiales de temas particulares que fueron presentados en los diversos Congresos Interamericanos realizados por la Asociación Interamericana de Ingeniería Sanitaria y Ambiental (AIDIS) y que en forma adicional fueron sometidos al proceso de revisión interno de la revista.

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IDENTIFICAÇÃO DE REGIÕES PLUVIOMETRICAMENTE HOMOGÊNEAS NA SUB BACIA TROMBETAS

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IDENTIFICATION OF RAINFALL HOMOGENOUS REGIONS IN THE TROMBETAS SUB-BASIN

Recibido el 17 de marzo de 2016; Aceptado el 23 de marzo de 2017

Abstract

Precipitation is a highly relevant climatic factor, mainly in tropical regions, since it affects elements such as: temperature, relative humidity and wind. Knowledge about the hydrological behavior of a region is directly related to the implantation of hydraulic, industrial, agricultural and human supply activities. However, due to the lack of rainfall data, techniques such as hydrological regionalization are used to transfer data from well-monitored sites to those with poor monitoring. For this, grouping techniques are applied to create the homogeneous regions. The work aimed at the application of Ward's hierarchical method for the creation of pluviometrically homogeneous groups in the Trombetas Sub - basin, using latitude, longitude, altitude and monthly mean precipitation as grouping variables. This technique was applied in 32 pluviometric stations, resulting in the generation of 5 groups with a good spatial representation of the homogeneous regions. After the interpolation of the data, it was possible to notice that the type of activity predominant along the sub basin, as well as the altitude in which the seasons are, had a significant influence on the rainfall indexes, And reduction in more anthropized areas. Despite the absence of some rainfall data, the application of the Ward method with the aid of the Kriging interpolator formed islands of homogeneous groups well distributed in the sub basin. The resulting rainfall spatialisation is well represented by the isoietas map, which contributes to the improvement of the management of water resources in the region and to the planning of works in the field of engineering.

Key Words: cluster analysis, rainfall, Ward method.

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CODIGESTIÓN ANAERÓBICA DE FANGOS DAF Y EFLUENTES DE PREDIOS LECHEROS

FAD SLUDGE AND DAIRY FARM EFFLUENTS ANAEROBIC CODIGESTION

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Recibido el 1 de julio de 2016; Aceptado el 23 de junio de 2017

Abstract

Currently, industries incorporate technologies and processes to improve the liquid effluents quality, in order to comply with the environmental legislation. In the case of food industries, such treatments generate a large amount of organic sludge with different characteristics, which must be properly disposed. An alternative to valorize this waste and reduce pollution is to generate biogas and bio-fertilizer. The aim of the study is to evaluate the anaerobic digestion of sludge generated in effluent primary treatment from a dairy industry. A pilot anaerobic reactor (1000 liters) was designed and constructed and after that two experiments studying the co-digestion of the mentioned waste were conducted. It was concluded that the co-digestion of dairy farm effluent and dairy industry FAD waste treatment is feasible, allowing biogas production.

Key Words: biogas, FAD sludge, dairy, anaerobic digestion.

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PIRÓLISE DE LODO DE ESGOTO EM CILINDRO ROTATIVO PARA A PRODUÇÃO DE BIOCOMBUSTÍVEIS

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SEWAGE SLUDGE PYROLYSIS USING ROTATING CYLINDER TO PRODUCTION OF BIOFUELS

Recibido el 22 de julio de 2016; Aceptado el 22 de mayo de 2017

Abstract

The aim of this work was to produce, from pyrolysis of sewage sludge, biofuels targeting industrial application. The sludge used in this study was produced in the UASB. The tests were performed in a thermal reactor rotating cylinder with a capacity to process up to 2 kg of biomass / h. The reactor was operated at temperatures of 450, 500, 550 and 600 °C. Increasing the temperature from 450 to 600 °C favor the increase of gaseous fraction and the decrease of fractions solid and liquid. The highest yield of biochar was 62.3 %, obtained 450 °C. The maximum yield of bio-oil was approximately 10.8 %. The higher gas content was 22 %. The bio-oil had the following characteristics: pH 6.2, density between 1.0 and 1.1 g/mL, viscosity between 2.6 and 3.2 cSt and highest heating value between 17.0 and 18.0 MJ/ kg.

Key Words: biomass, UASB, biochar, bio-oil, industry.

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APLICAÇÃO DE PROCESSOS OXIDATIVOS AVANÇADOS PARA TRATAMENTO DE EFLUENTE DE INDÚSTRIA DE PAPEL E CELULOSE

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APPLICATION OF ADVANCED OXIDATION PROCESSES FOR WASTEWATER TREATMENT OF PULP AND PAPER INDUSTRY

Recibido el 27 de septiembre de 2016; Aceptado el 8 de junio de 2017

Abstract

The pulp and paper industries have a high potential for pollution due to high production of liquid effluent with high staining, organic loading, and deleterious compounds. Conventional approaches, such as biological treatment, are often not sufficient for degrading this type of effluent. Thus, identifying novel treatment alternatives, such as advanced oxidative processes, is necessary. The main aim of this work was to evaluate the efficiencies of the Fenton and photo-Fenton processes for the degradation of final effluent from the pulp and paper industry. For this, we conducted several tests in the dark as well as under natural and artificial irradiation, at pH 3, a volume of 250 mL, an Fe^{2+} concentration of 15 mg/L^{-1}, and a H_2O_2 concentration of 200 mg/L^{-1}. The best results were obtained from the experiments performed under artificial irradiation, in which the removal of COD, color, turbidity, and total phenols was 60, 99, 99, and 80%, respectively, after 240 min of treatment. The results demonstrated the efficiency of the photo-Fenton process, supporting its potential for post-treatment of this type of effluent.

Key Words: Fenton, Phenolic compounds, Photo-Fenton, Wastewater pulp and paper.

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ESTIMACIÓN DEL CAMBIO DE USO DE SUELO EN LA ZONA NÚCLEO DE LA RESERVA DE BIOSFERA BOSAWÁS, NICARAGUA, EN EL PERÍODO 2015, CON APOYO DE TÉCNICAS DE SENSORAMIENTO REMOTO Y MÉTRICAS DE PAISAJE

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ESTIMATE OF LAND USE CHANGE IN THE CORE AREA OF BOSAWAS BIOSPHERE RESERVE, NICARAGUA, IN THE PERIOD 2015, WITH SUPPORT ON REMOTE SENSING AND LANDSCAPE METRICS TECHNIQUES

Recibido el 17 de octubre de 2016; Aceptado el 23 de junio de 2017

Abstract

The continued destruction of forests contributes to the decline of biodiversity, due to the loss of microhabitats; changes in dispersal patterns and food as well soil erosion. One way to cushion these environmental problems is linked to know the dynamic change of land use. Biosphere Reserve Bosawás whose extension comprises approximately 735,491.35 ha, has undergoned a radical transformation in recent years, mainly by migration of mestizo population. In this article the change in land use in 2015 in a sample of 24.956 ha is analyzed, for this purpose tools such as landscape metrics and remote sensing analyzes were applied. The results for the study area show that there is currently only 15% of concentrated forest patches whose areas are less than 1 ha, 31.48% are scattered patches of forests; 32.36% represent patches of shrubs or bushes and 16.90% bare soil and the remaining 4.28% are bodies of water.

Key Words: RB Bosawás, remote sensing, landscape metrics.

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TRATAMENTO DE EFLUENTE DE FÁBRICA DE RAÇÃO ANIMAL POR FLOTAÇÃO POR AR DISSOLVIDO

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PET FOOD INDUSTRY WASTEWATER TREATMENT BY DISSOLVED AIR FLOTATION

Recibido el 31 de octubre de 2016; Aceptado el 9 de julio de 2017

Abstract

The food industries produce large amounts of wastewater containing high concentrations of dissolved organics, suspended solids, oils and greases, color, nitrogen and phosphorus, which, if untreated, can become potential sources of pollution to water bodies. The aim was to analyze the treatability of the effluent of the animal feed industry by dissolved air flotation (DAF) technology with the addition of coagulant polyaluminium chloride (PAC). The effluent was granted by an industry which produces palatability to pet food from solid by-products of other industrial processing meat products. The effluent was subjected to treatment by flotation in a PAC coagulant dosage range of 40, 60 and 80 mg/L. We used the software R for statistical analysis. Among the different PAC dosages coagulant analyzed in this study, the concentration of 80 mg/L was that provided the best results in the treatment of animal feed mill effluent with high color removal, turbidity, COD, total phosphorus and ammonia nitrogen removal rate. The DAF technology is suitable as a means of primary treatment for pet food industry effluent. Finally, it is evident the need for a further biological treatment to the flotation process.

Key Words: Nutrients, palatability for animal feed, polyaluminium chloride, wastewater.

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APLICAÇÃO DA MATRIZ GUT NA GESTÃO INTEGRADA DE RESÍDUOS SÓLIDOS DA CIDADE DO RECIFE-PE

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GUT MATRIX APPLICATION IN SOLID WASTE INTEGRATED MANAGEMENT OF THE CITY OF RECIFE-PE

Recibido el 8 de noviembre de 2016; Aceptado el 25 de julio de 2017

Abstract

The appropriate management of municipal solid waste is fundamental in preserving the environment, quality of life and human health. It is therefore one of the main issues to be resolved by the government and one of the most costly. In this sense, quality tools are used to assist in management. The GUT priority matrix or GUT matrix is used whenever it is necessary to prioritize actions within a set of alternatives. Thus, the objective of this study is to propose the use of prioritizing actions tool, GUT Matrix, in solid waste management of Recife-PE city as an aid in decision making of public managers. By using the matrix have been defined and discussed 10 items classified as priority in the management of solid waste. The tool proved efficient to guide the prioritization of actions, but there is the need for a thorough understanding of the problems discussed, and the disadvantage of not having rules on driving tool methodology, such as the percentage of variables to be prioritized and not set tiebreakers.

Key Words: management of solid waste, prioritizing actions, tools qualities.

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MEMBRANAS CERÂMICAS DE ULTRA E MICROFILTRAÇÃO DESENVOLVIDAS POR PRENSAGEM ISOSTÁTICA PARA O TRATAMENTO DO EFLUENTE DA PRODUÇAO DE BIODIESEL

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MICRO AND ULTRAFILTRATION CERAMIC MEMBRANE DEVELOPED BY ISOSTATIC PRESSING FOR TREATMENT OF THE EFFLUENT FROM BIODIESEL PRODUCTION

Recibido el 9 de enero de 2017; Aceptado el 10 de julio de 2017

Abstract

This paper describes the manufacture of ceramics membranes by isostatic pressing, in order to verify its applicability in the treatment of effluent from biodiesel production. The membranes were characterized regarding its structure and morphology by scanning electron microscopy, porosimetry by mercury intrusion and determination of porosity and density. Four ceramic membranes of different morphologies were tested in an experimental module and parameters such as; transmembrane pressure and flow were used to evaluate the dynamic fluid performance of the membranes in the process. To evaluate the efficiency of the membranes, concerning quality of the treated effluent, color analyzes were performed, turbidity, COD and pH. The effluent was also characterized for comparison of results. Of the tested membranes, which demonstrated better efficiency with respect to the quality of the obtained permeate was the composite asymmetric membrane (alumina-zirconia membrane), sintered at 1500 °C. Thus, this membrane was retested at two different pressures in order to identify an improvement in performance. It was observed that 3 bar the membrane showed better flow and improved retention of color and COD and decreased turbidity of the permeate. Analysis of oils and greases and gas chromatography were also carried out and indicated high concentration of fatty matter present in the permeate. Therefore, this membrane was not fully effective, requiring additional methods or pre-treatment of the effluent so that after treatment is in accordance with environmental legislation and may be discarded.

Key Words: Biodiesel, ceramic membranes, isostatic pressing, ultrafiltration, wastewater treatment.

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