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contents

Beet juice purification using a recycled amount of the first carbonated MUD

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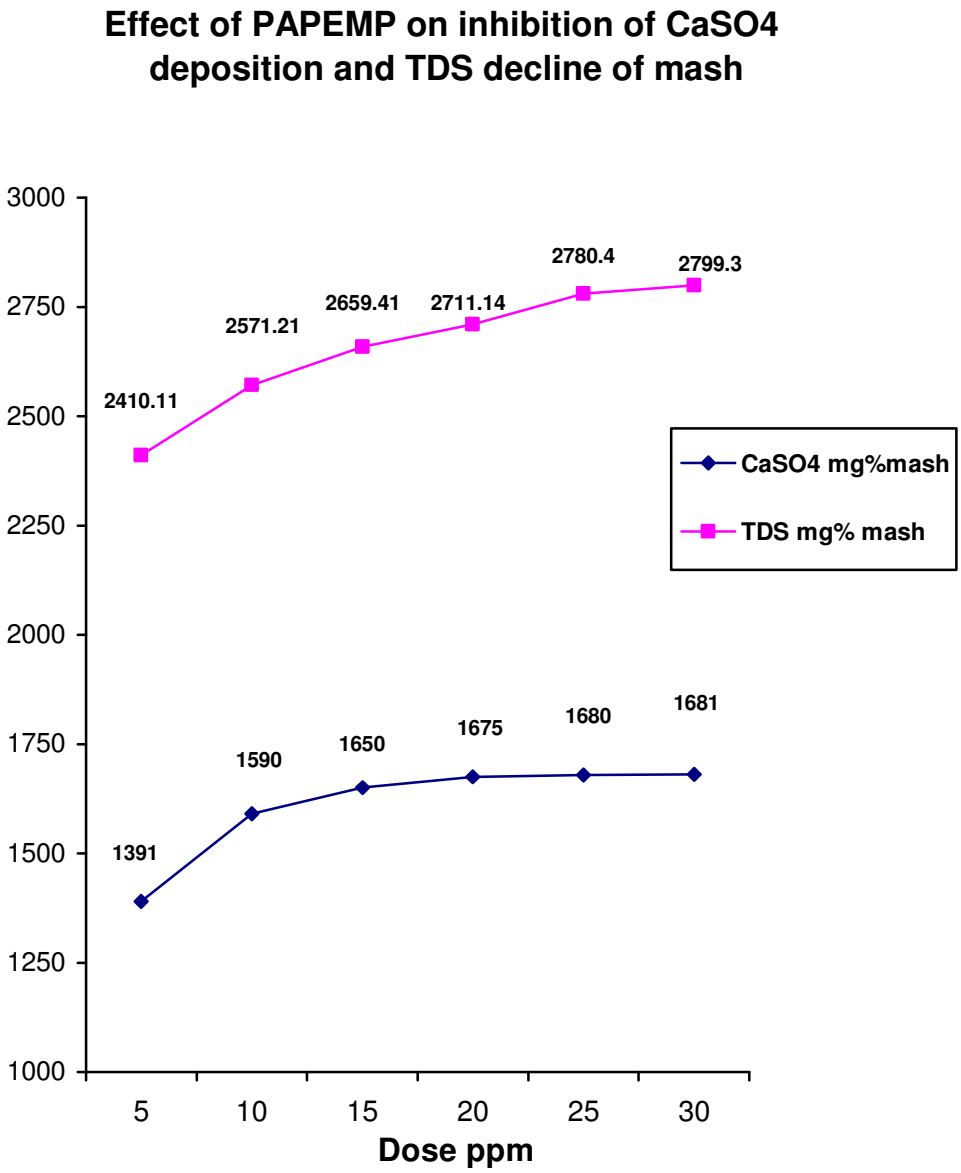
Abstract

Through a conventional beet juice purification technique, the amount of recycled mud to the prelimer depended on the concentration of the product, and it ranged from 50 to 60 % of the total mud, which equated to 3 – 6 % on diffusion juice. This study dealt with the lime consumption in the purification of beet juice as a function of the amount of the 1st carbo CaSO4 mg%mash

TDS mg% mashnated juice to be recycled. The results showed that the return of the 1st carbonated mud to the raw juice (prelimer) had more harmful effect in comparison with its benefits. The return of the 1st carbonated juice to the predefecation should be completely stopped. This led to decreasing the lime consumption in the purification step by about 30-40%. Instead of the recycling of the 1st carbonated juice three methods were investigated: preliming sludge separation, precarbonation or recycling of the second carbonated mud. The data showed that, the preliming sludge separation method was the best selection. Also the precarbonation and recycling of the second carbonated mud could be done together to produce the same amount of $CaCO_3$ crystals produced from the 1st carbonated mud.

Keyword: lime consumption, 1st carbonated mud, prelimer, and alkalinity.


Effect of PAPEMP on inhibition of CaSO4 deposition and TDS decline of mash
3000
2750
2500
2250
2000
1750
1500
1250
1000
2410.11
2571.21
2659.41
2711.14
2780.4
2799.3
1391
1590
1650
1675
1680
1681
CaSO4 mg%mash
TDS mg% mash
5
10
15
20
25
30
Dose ppm

Studies on optimization conditions for alcoholic fermentation process of Delta beet molasses

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Abstract

A mixture sample of beet molasses from production line I of DELTA sugar factory at period from 9/2 to 12/2 during season 2010 was used as a good fermentation medium in this study. Sugar levels of molasses were adjusted to different concentrations (5, 10, 15, 20, 25 and 30%) using distilled water. The results appeared that the highest level of ethanol production was 9.2% (equal 90% of theoretical values). This level was recorded when used molasses with 20% sugar and grown for 72 hours. To know the optimum temperature for ethanol fermentation, the fermentation process was kept at 25, 30, 35 and 40˚C. Ethanol yield reached to maximum and turned out to be 9.2% after 48 hours at 30˚C. Also, effect of pH on ethanol production level was examined and the results appeared that the maximum ethanol level was obtained at pH 5.

Microbial analysis and alcoholic fermentation studies for Delta beet molasses

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Abstract

A series of 38 samples of beet molasses of the two production lines in Delta Sugar Company were collected during campaign 2010 for microbial analysis and assessment their ability for the ethanol production. All samples were completely free from yeast or filamentous fungi contamination. On the other side, contamination with bacteria was recorded in 27 samples with 200 – 6800 cfu/100 ml. Ethanol production levels from the first three samples (collected in the period from 27/1 – 8/2/2010) of the sugar production lines I and II were ranged between 4.2 – 5.9% and 5.3 – 7.8% (equal to 37.4 – 52.5% and 47.14 – 69.37% of theoretical values), respectively. On the other side, ethanol formation from all the other samples (collected in the period from 9/2 – 20/6/2010) of the sugar production lines I and II were fluctuated between 9.1 and 10.9 and 8.9 – 10.4% (equal to 80.93 – 96.94% and 79,15 – 92.49 of theoretical values), respectively. Ethanol production from a mixture of the 38 beet molasses samples reached to 9.3% (= 91% of the theoretical values) after 46 hours of fermentation.

Industerial waste water treatment and reuse in Delta sugar company

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Abstract

Great difficulties face Egypt in the modified convention of the Nile Basin countries to reduce their share of water. So, this study conducted on reuse of treated waste water in Delta sugar factory - as non-conventional water resources- after adding a new tertiary treatment to use the whole water safety and economically without causing any problems in industrial processes. That could be done by: disinfection of treated waste water by CaO for use as flume water, use of treated waste water as a juice extract water after disinfecting it by $Na_2S_2O_5$,and chlorination of condensate water by NaOCl.

Utilization of ion exchange resins: ambersep GT74 and Amberlyst A21 in Purification of Drinking Ground Water and its Characterization.

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Abstract

The aim of this work is to present experimental results on the evaluation and removal of some element contents from drinking ground water in Wadi El-Assiuti – Egypt using ion exchange resins: Ambersep GT74 (Resin I) and Amberlyst A21 (Resin II). The drinking groundwater samples were collected from different places of El-Fath region (Assiut Government) Egypt. The resin dose as the optimum condition for heavy metals and elements removal was determined. Ambersep GT74 and Amberlyst A21 were characterized by swelling, solubility, thermal properties like: thermal gravimetric analysis (TGA) and differential thermal gravimetric (DTG), differential scanning calorimetry (DSC), X-ray diffraction analysis, and scanning electron microscopy (SEM) were also determined and the data were discussed. Moreover, the present study, cation exchange resin (I) and anion exchange resins (II) were used to the removal some of heavy metals such as Fe^{+2}, Mn^{+2}, and Cd^{+2} ,alkali elements Ca^{++}, Na^{+}, K^{+} , and Mg and some anions such as sulphate (SO_4^{-2}) , Nitrate (NO_3^{-1}), from ground water used as a drinking water. The main objective of the present study is the evaluation of cation exchange resins and anion exchange resins (I,II) in the purification of drinking ground water which used as drinking water in the studied areas.

Keywords: drinking water, characterization, element contents, heavy metals, ion exchange resins,

Response of sugar beet grown on different soils to anhydrous Ammonia injection

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Abstract

Two field experiments were conducted at the experimental farm of Delta Sugar Company at El-Hamol, Kafr El-Sheikh, Egypt during two successive seasons (2007-08 and 2008-09) to study the effects of three levels of injected anhydrous ammonia (60, 80 and 100 kg N/fed) and three sawing time after injection (immediately, 3 days or 6 days) on growth and quality of sugar beet grown in saline and non-saline soils. The response of sugar beet to anhydrous ammonia injection was compared to N fertilization with urea using the same levels of N in the same soils.

The highest roots and sugar yields fad^{-1} were obtained with sowing sugar beet ball 6 days after injection of 100 kg N fed^{-1} as anhydrous ammonia. Roots and sugar yield were significantly affected by soil salinity and N fertilization enhanced the growth, roots and sugar yield.

Highest values of sucrose; purity, sugar loss; sugar extractable, extractability as well as impurities were obtained in saline soil compared to normal soil which gave the highest values in the other characters under study. Ammonia fertilizer source exhibited a significant increase in values of sucrose, quality, alkaline coefficient, purity as well as sugar loss, sugar extractable and extractability percentages in both seasons. Agronomically, injection of anhydrous ammonia at 100 kg $Nfed^{-1}$ was more effective in increasing the roots and sugar

yield and overcome the adverse effects of soil salinity on growth of sugar beet plants, roots and sugar yields.

Optimal Egyptian factors affecting nonsugar elimination in beet juice purificaton and economic return on sugar recovery

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Abstract

The quality of sugar produced in sugar beet industry is highly dependent on the efficiency of the chemical treatment i.e. clarification process, which can be considered as the bottleneck of sugar manufacture . Therefore, any improvement of the clarification process reflects itself on the quality of sugar and its yield. Production of sugar from sugar beet requires a series of sequential unit operations, which comprise beet preparation, extraction clarification, evaporation, crystallization, centrifugal separation, drying and packaging.

The main goal of any sugar technology is to get rid of impurities from sucrose solutions and to produce sugar of high quality. Separation of nonsugars from sugar is the aim of almost every step of sugar production and the purpose of juice purification is to remove the majority of these nonsugars.

In Delta Sugar Company the percentage of nonsugar elimination is relatively low compared to the theoretical ones .The aim of the present study is to suggest effective procedures to increase removal of nonsugars from beet juice clarification in order to increase the purity of the produced sugar and to achieve a low sugar content in molasses during conditions of both hot and cold liming.

Keyword: Sugar beet, α-amino nitrogen liming and nonsugar elimination (NSE).