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NOTE

Study of Secondary Spent Wash after Biogas Recovery as Biogas Effluent

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Potash can be recovered more easily by centrifuge from secondary spent wash after concentration than the primary spent wash, secondary spent wash concentrate being less viscous and thinner. About 6 tons of potash in good form can be daily obtained against about 7 tons from primary spent wash. Carbon that can be obtained by the method already used though less than primary spent wash is sufficient to pose problems of pollution. daily about 8 to 10 tonnes of carbon will be available.

Secondary spent wash received from a nearly sugar factory has been examined and potash has been obtained by much easier method in good form and with the machinery that will be available with sugar factories, that is, by centrifuge. The method has been tried with primary spent wash concentrate also but with more time for settling and separation. Carbon has been obtained by the method already referred[1], the amount present being sufficient to pose a problem.[2] Carbon has also been obtained from primary spent wash (20 L) by the known method[3]. So by the method proposed[2] and tried on 20 L capacity it is possible to overcome the problem of pollution totally (there being no effluent) with much less additional investment. Total process, biogas recovery, easy recovery of potash and additional amount of carbon (8 to 10 tons per day) obtained, may prove economic with no headache of pollution left. Comparative study of other bye-products has also been attempted.

All the chemicals used were of C.P. quality such as hydrochloric acid, sodium hydroxide, n-butanol, acetic acid and phloroglucinolate.

Seconday spent wash (1.5 L) was concentrated (150 mL), settled overnight and centrifuged. The separated solid was taken in distilled water (25 mL) (filtrate and washing being separately kept) and potash recovered[1]. A clean pinkish solid was obtained after drying (yield 20 g). The supernatant liquid was treated as per the method proposed[2] and allowed to dry at 112°C. The solid was washed with water thoroughly (yield 25 g). So daily 6 tons of good potash and 8 tons of carbon may be available from secondary spent wash as against 7 tons of potash and about 15 tons of carbon[2] available from primary spent wash.

Primary spent wash (20 L) was concentrated to 1/6th volume in a tinned copper

container (50 L capacity), bottom being treated with antiscaling agent, and treated as proposed[3] and dried at 120°C. The contents were taken in warm water, washed and dried (yield 600 g). The yield of potash by refereed method[2] was 250 g. The copper container was not at all atttacked proving that the container will last long and the investment almost recoverable after a long time.

Secondary spent wash (100 mL) was diluted with water and slaked lime (15 g) was added rapidly and distilled, ammonia being absorbed in HCl (0.1 N). Back titration using melthyl red as an indicator showed ammonia 200 mg/L. Therefore ammonia that may be available per day will be only 100 kg as against 400 kg that may be daily obtained from primary spent wash.

Secondary spent wash (100 mL) was just neutralised with precipitated calcium carbonate and filtered. The filtrate was concentrated and dried. The dry mass was extracted with isopropanol (50 mL) by refluxing for 4 h. The solvent was decanted and residue dried. The dried residue was dissolved in water (30 mL) and extracted with n-butanol (50 mL). The butanol layer was separated and boiled till temperature reached 112°C, and cooled. Both extracts were spotted and run in butanol (butnol, acetic acid and water 4 : 1 : 5). Both the extracts showed the presence of only one amino acid (R_f value 0.23 with the same intensity as in primary spent wash)[2] and maybe asparagine which is present in more quantity in sugarcane juice.

Pentosans were determined by the method of Shorger[4]. Spent wash (125 mL) was added to concentrated hydrochloric acid (100 mL) and the solution was slowly distilled. The distillate (110 mL) was collected and hydrochloric acid 12% (100 mL) was added to the residue. Distillate (100 mL) was collected, mixed and the total distillate (210 mL) was treated with phloroglucin in hydrochloric acid (12%) and set aside for one day. The precipitate was filtered, dried and washed (with alcohol). Phlorogulcin showed the quantity of pentosans as arabans to be 1.8 g/L. The daily availability in 5 lakh litres of normal distillate will be 0.8 ton; or in other words daily 0.8 ton of arabans will be poured in to the soil so that it may not be attacked by microbes.

Attemps are being made to obtain the carbon in briquet form after proper addition of coal dust and other suitable material and to bring the quantity of catalyst referred[3] to a minimum.

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