

# ALIEN PROPERTY CUSTODIAN

## MANUFACTURE OF EXTRACTING ALIPHATIC ACIDS, ESPECIALLY ACETIC ACID

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This invention relates to the manufacture of extracting aliphatic acids, especially acetic acid.

It is known to recover aliphatic acids by extracting in the counter current an aqueous solution thereof in columns provided with filling material, like Raschig rings, and by the aid of organic liquids, like ethyl-acetate.

According to my pending application Ser. No. 173,949 the aqueous liquid and the extraction liquid are passed through the apparatus with linear velocities which are generally greater than 0.2 cm pro sec. related to the total gross section of the column. To obtain the maximum extraction effect it was necessary to adjust the column to the desired through-put. When this throughput was lowered, the amount of acid in the aqueous wastes increased greatly and therefore the efficiency of the apparatus was undesirably decreased. On the other hand, when surpassing the upper limit of velocity the extraction effect was likewise decreased.

According to my invention it is possible to obtain excellent yields of extraction when working with different throughputs, only by regulating the height of the two liquid phases within the column. Therefore, when changing the throughput of liquids through the extraction column the level between the aqueous layer and the layer of extraction liquid, e. g. ethyl-acetate to such a degree, until the aqueous wastes contain only minimum amounts of acid. This favourable level is then maintained in a constant height as far as the throughput does not considerably alter.

The present invention is based on the new and surprising fact that the extraction effect depends not only from the diameter of the column but also from the height of the level between the two liquid phases within the column. Generally speaking, decreasing throughputs of the liquids require that the layer of that liquid is increased which is fed through the apparatus with the greater throughput. It is also necessary to increase the throughput of ethyl-acetate to an uneconomical degree. It was hitherto usual to maintain the aqueous layer at a certain height without respect to the desired throughput of liquids through the apparatus.

According to the present invention the extraction column is provided with devices indicating

the level between the 2 liquids within the column reaching from the bottom to the top thereof. In that way it is possible to control the layers at any point in the interior of the column.

Hitherto it was usual to extract diluted acetic acid with ethyl-acetate in such a manner that the aqueous layer was only restricted to the lower part of the column, that is the part which was not filled with any filling material.

According to my invention, especially when lowering the throughput of the diluted acid the height level between acid and ester is increased into the space which is filled with filling material or even near the top of the extraction column.

### Example

The column which was used, had a diameter of 1040 mm, a height of 10 m and was provided with cylindrical filling bodies of maximum 35 mm diameter. Into this column 4000 liters aqueous acetic acid of 17% and 1200 liters of ethyl-acetate were fed in the counter current in such a way that the layers of aqueous acid and ester were in the proportion of 1:9 and whereby the aqueous layer was beneath the zone of filling bodies. The contents of acid in the aqueous wastes was 0.06-0.08%, that is the yield of extraction, amounted to 99.3%. By exchanging the throughput of the above maintained diluted acetic acid to 2000 liters and in similar way to 6000 liters ethyl-acetate in the same apparatus the amount of acid in the aqueous wastes was increased over 1%. The extraction yield was therefor decreased to ca. 94%. When increasing the level between the two liquids in the column to such a degree that the layers of the aqueous liquid and the upper layer of ester were in the proportion of 3:1, and whereby the level was now within the zone of filling bodies the amount of acid in the aqueous wastes decreased below 0.1%, according to an extraction effect of 99.0-99.5%. This proportion between the two levels, which may in every case easily be obtained by controlling the acid amount in the aqueous wastes, is substantially maintained inasmuch as the throughput of liquids does not greatly alter.

The above described process may in similar way be performed when extracting other aliphatic acids with known organic solvents.

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