

Optimisation of separation 2-methylbutanol-1-ol and 3-methylbutanol-1-ol from fusel oil by rectification.

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The fusel oil is a mixture of higher alcohols , where isoamyl alcohol (3-methylbutanol-1-ol) and 2-methylbutanol -1-ol amounts big part . These two products are interesting for next elaboration.

We studied separation of of these two components from rum production of fusel oil by rectification. Our aim was to obtain 99% purity of 3-methylbutanol-1-ol and 2-methylbutanol -1-ol mixture. We optimised the reflux ratio in packed bed rectification column and several parameters of column work conditions.

The glass column was from Sulzer company, with packed bed 1,49 m, diameter of column 0,04 m, packed bed was filling with 27 elements of EX segment (0,055 m each) . During distillation the temperature and the pressure in the column, the temperature on the top and at the bottom of column, the pressure in the column, the temperature of isolation, the pressure drop in the column was measured and registered.

Fusel oil No.1 was distilled at the reflux ratio 2:1, 3:1 and 10:1. We received the purity of 3-methylbutan-1-ol a 2-methylbutan-1-ol mixture more than 90 % in 5 fractions. The results show that for receiving 99 % concentration of this mixture, the reflux ratio 3:1 is sufficient. Fusel oil No. 2 was rectified at the reflux ratio 2:1, 3:1, 5:1 and 10:1. We achieved the concentration of 99 % of 3-methylbutan-1-ol a 2-methylbutan-1-ol at the reflux ratio 5:1 already after 3 fractions with their volume yield 27,9 %. The best results, we achieved at reflux ratio 10:1 when fractions comprising 99 % 3-methylbutan-1-ol a 2-methylbutan-1-ol provided 49,9 % yield. But at this reflux ratio is highest expenditure of energy.

Our aim was to obtain 99% concentration of this mixture. The results showed that for fusel oil No.1 the reflux ratio 3:1 is sufficient, for fusel oil No.2 the reflux ratio 5:1 is sufficient.

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