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A STUDY OF THE CHANGE IN THE COMPOSITION OF RAPESEED OIL FATTY ACIDS ON HYDROGENATION

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At the present time, hard plant fats are obtained mainly by hydrogenating liquid oils with various catalysts at high temperatures, which, as is known does not permit the biologically active substances present in the oils to be fully retained in the native state [1].

We have carried out the hydrogenation of erucic-acid-free rapeseed oil in solution over a Ni—Cu—Mo—Al catalyst with the addition of various amounts of chromium. The solvent used was extraction gasoline, and we studied the change in the fatty acid composition of the oil.

The initial oil had the following indices: iodine No. 111.6% I_2; acid No. 0.30 mg KOH; color 20 mg I_2; sulfur content $1.0 \cdot 10^{-4}$ %; fatty acid composition (% GLC): 14:0 — 0.6; 16.0 — 3.7; 16:1 — 0.8; 18:0 — 2.1; 18:1 — 56.0; 18:2 — 24.1; 18:3 — 7.7; 20:0 — 1.0; 22:0 — 0.5; and 22:1 — 2.4 (saturateds — 7.9; unsaturateds — 92.1). The initial rapeseed oil was hydrogenated in an autoclave of the column type by the flow method [2] at a constant temperature of 90°C, a hydrogen pressure of 300 kPa, a space velocity of hydrogen of 3.0 liters/h, and a rate of feed of oil of 0.15 liter/h. The activity of the catalyst was judged from the change in the iodine No.

Table 1 shows the fatty acid compositions of the oil hydrogenated over a catalyst with the addition of various amounts of the promotor. As a result of the investigation it was established that the promoting influence of chromium substantially raises the hydrogenating activity of the catalyst.

TABLE 1. Fatty Acid Compositions of the Hydrogenates, % GLC

Experiment No.	Amount of promotor, % on the catalyst	I. No., % I_2	Composition of the fatty acids			
			total saturateds	total monoenoics	18:2	18:3
1	5.0	57.6	62.8	34.4	2.1	0.6
2	3.0	68.1	52.1	40.8	5.7	1.4
3	2.0	76.2	37.9	46.8	12.6	2.7
4	1.0	83.3	21.3	58.1	16.7	3.9

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