change and the yield of products of hydrogenation thermal catalytic processing on the investigated composite catalysts was studied. Earlier in our works,[17] it has been shown that processing by ultrasound of a rubber crumb with degree of dispersion of 0.6-0.8 mm in water has practically no significant effect on the yield of a liquid product and its fractional composition under optimum conditions of carrying out the process (T = 400°C; paste former PF: rubber = 1: 1; catalyst - WFP: zeolite = 40:60; P = 5-7 MPa, t = 60 min.). In this work it was revealed that a variation of parameters of ultrasonic processing in the range of values of intensity: I = 1-5 W/cm^2; t = 50-150 s of significant effect on dispersion and structural changes of an organic part of rubber and plastic did not render.

The ultrasonic treatment of plastic crumb crushed to a degree of dispersion of about 2 to 6 mm in water in the investigated regimes proved to be practically impractical, since there was practically no cavitation effect on such a strong, fatty and adhesion-resistant material. Therefore, for a research of influence of cavitational processing on composition and the yield of products of hydrogenation thermocatalytic processing it was used a mixture rubber: plastic of composition 1:1 with a size of particles from 2 to 6 mm. The process was carried out on catalyst WFP: zeolite = 40:60 at T=450°C; P=5-7 MPa; t=15 min.; PF: waste = 1:1. Processing of the studied mixture of rubbers and plastic at I = 1, 3, 5 W/cm^2 in the range of values of time of processing 50, 100, 150 sec. at the room temperature does not give accurate regularity on the yield of gaseous and liquid products, and also on the yield of light to 180ºC, average 180-250ºC and heavy distillates 250-320ºC. A total yield of liquid distillate ranges within 54.4 – 61.0 wt.% (Fig. 6). Yield of gases depends on intensity and time of cavitational processing a little.

As, generally, there are changes in the structure of rubbers caused by multiple-factor energy influence in the form of an impulse, which are followed by a mechanical rupture of associative molecules links of rubbers and the vulcanization sulfur, and also hydrodynamic influence by shift of tension in liquid, the cavitational processing by water should promote separation of a metal cord, soot and sulfur and other fillers from an organic part that in turn should cause its easier transformation into liquid and mainly gaseous products. It was found that the most optimal for the liquid product yield are rubbish and plastic waste, treated with ultrasound at I = 5 W/cm^2; duration - 150 sec. - 61.0 wt. %.

Influence of radiation exposure of waste of rubbers and plastic on the yield and composition of liquid products in the process of their hydrogenation thermocatalytic processing on catalyst WFP:zeolite= 40:60 has been investigated at T = 400°C; P = 5-7 MPa; t = 15 min.; PF: waste = 1:1 (Fig. 7). The irradiation was carried out by an electron beam with a density of 2 μA / cm^2 with a variation in the irradiation dose from 100 to 500 kGy. As can be seen from Fig.7, the total yield of the liquid fraction from the previously irradiated mixture rubber : plastic varies in the range 32.18 - 53.39% by wt. It should be noted that in the irradiation range of 100 and 300 kGy, respectively, high yields of the liquid fraction are observed. The optimum yield of the gasoline fraction is revealed at an irradiation dose of 500 kGy, and for diesel fuel at a dose of 300 kGy.

Also, it was revealed that radiation of rubbers and plastic in the studied interval of doses has no significant effect on the yield of light distillates in the course of hydrogenation catalytic processing. The yield of the gas fraction increased by about 4-5 wt. %. This is due to the destructive splitting of bonds in rubbers and polymer cord during the irradiation, which leads to further easier thermal decomposition of molecules under the influence of high temperature to hydrocarbon gases of the composition C_1-C_4, carbon oxides, and is also accompanied by the formation of sulfur-containing gases. It can be caused by the prevalence of process of thermolysis over catalytic cracking and hydrogenation transformations of the formed short molecules. As a part of a dry product there are mainly cord components, metals, soot, mineral additives, sulfur, etc. The essential contribution to the formation of a liquid product is made by fuel oil as binding, a source of hydrogen and reagent.

Thus, preliminary investigations of the effect of irradiation of waste rubber and plastics have shown that it reduces the yield of liquid fractions by about 8-10 wt.% and increases gas formation by 4-5 wt.%. Analysis of the hydrocarbon gas composition by the gas-liquid chromatography method showed the presence of paraffins and isoparaffins of the C_1-C_4 composition, olefins and dienes, gas condensate of the composition C_4-C_5, H_2, CO, CO_2, H_2S.[12, 18] It was found, in the process