



NON-CONVENTIONAL METHODS OF PREPARATION OF POLYMER WASTE TO CATALYTIC PROCESSING INTO THE FUEL

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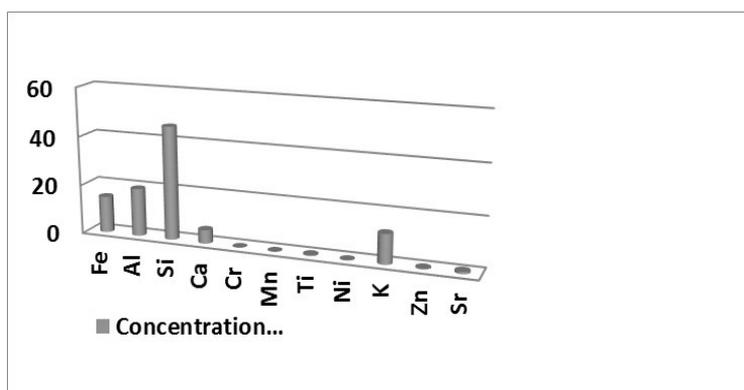
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The influence of non-conventional methods of preparation of raw materials on the basis of waste rubber and plastics on hydrogenation thermal catalytic processing by preliminary treatment by ultrasound, irradiation, cryogenic treatment with liquid nitrogen along with mechanical grinding was investigated. The catalysts of the process are the composites based on polymetallic wastes of ferroalloy production (WFP) and activated by acid treatment of the natural zeolite of the Kazakh Taizhuzgen deposit researched by X-ray fluorescence, X-ray diffraction and nitrogen porosimetry. It was found that the greatest yield of a liquid product is observed when the raw material is processed by ultrasound with the intensity of ultrasonic waves $I = 5 \text{ W/cm}^2$; 150 seconds. The irradiation of raw materials somewhat reduces the yield of liquid fractions and increases the formation of gas. Processing raw materials with liquid nitrogen, followed by mechanical grinding, allows changing the structure of the organic mass, which affects the yield, composition and quality of the products.



INTRODUCTION

Perspective non-conventional methods of physical and chemical influence are methods of cryogenic processing by liquid nitrogen, by ultrasound, radiations and other methods.^{1,2} The most effective way is their resonant processing. The phenomenon of cavitation is followed by concentration of energy which is capable to change physical and chemical properties of raw materials on the basis of carbon-containing waste, causes a depolymerization, increases the content of light hydrocarbons in the obtained liquid products. Cavitation is followed also by partial destruction of

molecules, with formation of free radicals which are capable to initiate the liquefaction process. The similar effect renders a way of preliminary radiation exposure and cryogenic processing of raw materials on the basis of solid carbon-containing waste.³⁻⁶ In recent years, along with the mechanical grinding of the solid carbon-containing raw materials based on waste, non-conventional methods of physical and chemical effects, such as sonication, cryogenic treatment and irradiation, are used.⁷⁻¹¹

The aim of the study was to determine the effect of preliminary cryogenic treatment, ultrasonic treatment and irradiation of raw materials based on polymer waste on the change in the yield and the

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