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The use of microwaves in the production of monomers

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Abstract

The results of studies on the use of electromagnetic microwave radiation to enhance the process of synthesis of monomers to production of synthetic rubber. Application of microwave discussed as an example of technology synthesis of butadiene and isoprene by two-step dehydrogenation of paraffins and a synthesis of isoprene from isobutylene and formaldehyde. In the two-step method of dehydrogenation of butane and pentane application of microwave energy is possible at both stages. In the first stage dehydrogenation of paraffins to olefins technology is proposed synthesis alumina-chromium catalysts under the influence of electromagnetic radiation at various stages of its preparation. Exposure to the microwave field in the steps of impregnation of an alumina support, and drying the catalyst allows to obtain a catalyst with a high catalytic properties, the olefin yield is increased by 4.3%, the selectivity increases by 3.8%. The catalyst has high strength and is supposed to work period. Is improved technological scheme of the process of dehydrogenation of paraffins on this catalyst. In the second step the dehydrogenation of olefins to diolefins is proposed to use the energy of the electromagnetic radiation directly to the activation reaction on the iron-potassium catalysts operating in the industry. Dehydrogenation of olefins under the action of microwave radiation can reduce the energy consumption of the process without reducing yield of diolefins. Exposure to microwave radiation in the process of synthesis of isoprene from isobutylene and formaldehyde, also allows to obtain a high yield. The highest catalytic properties in the electromagnetic field has a catalyst based on cationite of KU-2.