

Intensification of ethylbenzene dehydrogenation. Microwave radiation, acoustic and ultrasonic treatment impact on the microwave treatment of water.

© Lyliya M. Yunusova,^{1*+} Vladimir G. Uryadov,² Alexander G. Liakumovich,¹
Anatoly A. Lapin,³ and Raisa A. Akhmed'yanova¹

¹ Department of Synthetic Rubber. Kazan State Technological University.
K. Marx St., 68. Kazan, 420015. Tatarstan Republic. Russia.

Phone: +7 (843) 231-43-91; 290-60-57. E-mail: limarsel@mail.ru, oskar_karataev@mail.ru

² Department of Organic Chemistry. Kazan State Technological University.
K. Marx St., 68. Kazan, 420015. Tatarstan Republic. Russia.

Phone: +7 (843) 231-43-81. E-mail: vguryadov@mail.ru

³ Department of Aqueous Bio-resources and Aquaculture. Kazan State Power Engineering University.
Krasnoselskaya St., 5. Kazan, 420066. Tatarstan Republic. Russia.

Phone: +7 (843) 519-43-53. E-mail: lapinanatol@mail.ru

*Supervising author; +Corresponding author

Keywords: ethylbenzene, styrene, water, microwave radiation, acoustic and ultrasonic treatment.

Abstract

The main industrial method for styrene synthesis is the process of dehydrogenation of ethylbenzene in the presence of iron oxide catalyst. The data on the intensification of this process by treating the water used for steam dilution on the installation of continuous microwave radiation, acoustic and ultrasonic treatment. It has been found that the apparent velocity of rate-limiting reaction of styrene from ethylbenzene depends on the stage of desorption of the excited biradical state with the surface of the iron oxide catalyst.