



OPPORTUNITIES FOR SYNTHESIZING QUATERNARY AMINES IN TURKMENISTAN

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"The State Program for Integrated Development of Chemical Science and Technologies in Turkmenistan for 2021-2025" is an integral part of the "Social and Economic Development Program of the President of Turkmenistan for 2019-2025". The State Program of our Hero Arkadag set before us the tasks of modernizing the chemical industry, increasing the role of chemical science and technology in the development of our economy based on advanced technologies, innovations and scientific achievements, and increasing the speed of introducing the results of scientific research into production [1].

Turkmenistan is rich in various mineral resources. These resources are mainly concentrated in the Garabogazkol Bay, the Caspian Sea, the underground iodine-bromine waters of Balkanabad, and the Govurdak-Koytendag mineral deposits. One of the priority directions of the economy is to develop the chemical and technological system by diversifying the country's natural raw materials and increasing the level of processing [2].

Currently 1,2-halohydrins with at least 6 carbon atoms, which are used as reagents in green chemistry production centers, are easily obtained by the reaction between, for example, 1,2-epoxyalkanes with at least 6 carbon atoms and hydrogen halide. The reaction is preferably carried out in a 1:1 molar ratio with the above reagents. The corresponding halohydrin is obtained in quantitative yield with a shorter reaction time than the 1,2-epoxyalkane. Hydrogen halide can be used as concentrated aqueous solution of 37% HCl; 48% or 63% HBr; or 57% or 67% HI. The reaction temperature ranges from about 30°C to about 100°C. Such temperatures are usually obtained without external heating due to the heat of reaction. The reaction mixture is two-step when aqueous hydrogen halide solutions are used, and the reaction is completed within one hour. If liquid hydrogen halide solutions are used in dilute concentrations, the reaction will take longer. Halohydrins can also be obtained when using gaseous or dry hydrogen halide instead of using aqueous solutions. The halohydrin reaction product obtained from the process described above is usually heterogeneous, ie the reaction mixture consists of a mixture of 1-halo-2-hydroxyalkane and 1-hydroxy-2-haloalkane isomers. It is not necessary to separate these isomers for use in the invention. The hydride can also be obtained when using gaseous or dry hydrogen halide. [3]

Object of the invention - the quaternary ammonia compounds of the invention can be added to detergent formulations containing at least one detergent active compound to have a softening effect on laundry. Such detergent formulations are usually based on formulations containing non-ionic surfactants. In addition, the products of the invention can be applied to textile surfaces as a collapse aid. The activities in this field are aimed at the systematic and efficient use of our natural resources.

The novelty of the work is to increase the role of science within the framework of the reforms taking place in all sectors of the country's economy, including the development of innovative and digital technologies for the production of environmentally friendly, energy-saving, imported and competitive products through chemical science and new chemical technologies.

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