

Review

of scientific consultant Mun G.A. on the dissertation work of Timur Muratovich Bekbassov on the topic:

"Developing polymer additives for regulating oil rheological properties",
submitted for the degree of Doctor of Philosophy (PhD) in the specialty
6D072100 — "Chemical technology of organic substances"

This work is a continuation of the research conducted by Timur in his master's thesis on the study of the properties of oils and oil mixtures of the Kumkol region.

Timur Muratovich Bekbassov graduated with honors from the Chemical department of al-Farabi Kazakh National University in 2007. In 2010, he graduated from the correspondence department of the T.Ryskulov Kazakh University of Economics, receiving a second degree in Management. In 2016, he continued his studies at the Master's degree program of the Chemical Department of KazNU, which he graduated with honors in 2018. The presented dissertation work is a continuation of the research carried out by Timur in his master's thesis on the study of the properties of oils and oil mixtures of the Kumkol region.

Republic of Kazakhstan has the richest hydrocarbon resources, and most of them are transported through main pipelines. Ensuring uninterrupted and cost-effective transportation of this raw material throughout the year, and especially in conditions of low temperatures in winter, is the most important task of providing oil to all refineries of the Republic of Kazakhstan.

In this paper, an attempt was made to improve the properties of a commercial additive based on an ethylene-vinyl acetate (EVA) copolymer by radiation grafting to the main macro chain of sequences composed of their monomeric hydrophobic links.

During his doctoral studies, T. Bekbassov completed a large amount of experimental work at a good scientific level. For the first time, new depressant additives based on ethylene-vinyl acetate copolymers containing grafted macrochains representing a sequence of hydrophobic monomer units of various natures were obtained by radiation-initiated grafted copolymerization. For the first time, the kinetics and mechanism of grafting copolymerization involving monomers to ethylene-vinyl acetate copolymers and hydrophobic monomers have been investigated by the spin trap method using model reactions. It is shown that the formation of active radical centers initiating inoculation copolymerization is carried out as a result of the separation of an atom from the macro chains of ethylene-vinyl acetate copolymers, and in this process the tertiary CH groups of vinyl acetate monomer units of the copolymer macro chains are most active.

As a result of the conducted research, new polymers were obtained, which showed higher activity in improving the rheological properties of the Kumkol oil mixture, in comparison with the commercial analogue – "Randep-5102", which is currently used on this main pipeline.

I believe that T.M. Bekbassov has already developed as a good specialist in this field, and his dissertation work "Developing polymer additives for regulating oil rheological properties", in terms of relevance, scientific novelty and practical significance, fully meets all the requirements of the Committee for Control in the Field of Education and Science of the Ministry of Education and Science of the Republic of Kazakhstan, submitted to the dissertations of the Doctor of Philosophy (PhD) in the specialty 6D072100 — "Chemical technology of organic substances".

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