

The influence of copolymers of ethylene with vinyl acetate on the properties of oil-swelling rubbers

© Nikolay F. Ushmarin, Dmitry V. Pelipenko, Konstantin V. Efimov,
Sergey I. Sandalov, and Nikolay I. Koltsov*[†]

Department of Physical Chemistry and Macromolecular Compounds. Chuvash State University
of I.N. Ulyanov. Moskovsky Ave., 15. Cheboksary, 428015. Chuvash Republic. Russia.

Phone: +7 (8352) 45-24-68. E-mail: koltsovni@mail.ru

*Supervising author; [†]Corresponding author

Keywords: caoutchouc, oil-swelling rubber, copolymers of ethylene with vinyl acetate, rheometric and physical-mechanical properties, vulcanizates.

Abstract

The development of the oil and gas production industry is accompanied by an increase in the requirements for the physico-mechanical and operational properties of the sealing elements. Among them, oil-swelling rubber sealing elements are of interest, which, due to the increase in volume, ensure the sealing of the space between the well and the ground. To improve the performance of rubber-technical products, various technological additives are introduced into the rubber mixes. Such additives can be copolymers of ethylene with vinyl acetate (SEVA), which are well combined with carbon chain caoutchoucs due to the formation of coordination bonds with their molecules. This helps to increase the strength and performance properties of rubbers. In this connection, the effect of copolymers of ethylene with vinyl acetate – sevilenes 1104-030, 11808-340 and ethylene vinyl acetate (EVA) MarPol 1802, differing in the content of vinyl acetate units and the yield index, on the rheometric properties of a rubber mixture based on a combination of butadiene-nitrile and isoprene rubbers, physical-mechanical and operational parameters of vulcanizates. The study was carried out to improve the physical and mechanical properties of rubber used as a basis for the manufacture of oil-swelling sealing elements of sleeve type for the oil and gas production industry. The rubber mixture was prepared on laboratory rolls and vulcanized in an electrically heated press. The influence of oil on the physico-mechanical and operational properties of vulcanizates, as well as the degree of swelling of vulcanizates after their soaking in oil at 100 °C for some time has been studied. As a result of the conducted researches it was established that the best rheometric, physical-mechanical and operational properties are vulcanizate of the rubber mixture containing sevilene 11 808-340. This rubber can be used as a basis for the development of a rubber mixture for the manufacture of oil-swellaable sealing elements.

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