

The influence of functional ingredients on the physico-mechanical and operational properties of rubbers for water-swelling sealing elements

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Abstract

The article investigated the effect of caoutchoucs, sevilen 11808-340, vulcanizing groups, fillers, plasticizers, directional ingredients on the physico-mechanical (conditional tensile strength, elongation at break, hardness, rebound elasticity, tear resistance) and operational properties of two rubbers (changes of conditional tensile strength of rubbers after exposure to water, weight changes after aging of rubbers in a solution of citric and hydrochloric acids, changes in the volume of rubbers after exposure to water). These rubbers are developed for the manufacture of the outer and inner layers of water-swelling sealing elements (WSSE) for the oil and gas industry. It has been established that rubber for the outer layer of WSSE based on butadiene-nitrile BNKS-18AMN, isoprene SKI-3 and ethylene-propylene SKEPT-40 caoutchoucs, as well as rubber for the inner layer of WSSE based on butadiene-nitrile BNKS-18AMN, butadiene-methyl styrene SKMS-30AR and ethylene-propylene SKEPT-40 caoutchocs possess the required physical-mechanical and operational properties. It was shown that these rubbers containing a vulcanizing group sulfur + thiazole 2 MBS, sevilen 11808-340, a combination of carbon black T 900 with rosil 175, talc and Karelite MK, petroleum resin "Sibplast", vermiculite and igloprobinovoe cloth, a combination of hydrosorbition polyacrylamide 639, sodium polyacrylate, perlite and Kometa-R reagent are characterized by improved physico-mechanical and operational properties. These rubbers can be recommended as the basis for the manufacture of the outer and inner layers of water-swelling sealing elements.

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