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The influence of the ratio of carbon black: silicon dioxide on the structure of the tread rubber

© **Artem M. Mokhnatkin**,[1] **Alexander L. Zotov**,[2]
Valery P. Dorozhkin,[3]* and **Elena G. Mokhnatkina**[4]
[1] *Management Company "Tatneft-Neftechim." Nizhnekamsk Industrial Area, 423570. Republic of Tatarstan. Russia.*
[2] *JSC "Nizhnekamskshina". Nizhnekamsk Industrial Area, 423570. Republic of Tatarstan. Russia.*
[3] *Nizhnekamsk Chemical Technology institut. Stroiteley St., 47. Nizhnekamsk, 423570. Republic of Tatarstan. Russia. E-mail: dorozhkinvp@mail.ru*
[4] *JSC "Scientific and Technological Center"Kama". Nizhnekamsk Industrial Area, 423570. Republic of Tatarstan. Russia. E-mail: ntc.nkama@mail.ru*

*Supervising author; +Corresponding author

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Abstract

Using a penetrating electron microscope we discovered a three-tier structure of silica in the tread rubber composition. It is established that in case of joint use of silicon and carbon black, the surface of carbon black particles is covered with a layer of particles of silicon dioxide of primary structure. There was estimated the effective activation energy of structural processes occurring in the tread rubber with different ratio of carbon: silica at different amplitudes of shear deformation. Using the method of tension relaxation there were revealed the structural features of the tread rubber containing only carbon black or only silica dioxide.