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**Carbonized elastomer based composites filled with carbon fillers and silicon carbide**

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**Abstract:**

The composites based on carbonized elastomeric matrices filled with carbon fillers and silicon carbide were proposed. The composites were produced by a three-stage method that included the preparation of highly filled elastomeric compounds, vulcanization, and low-temperature carbonization. Highly filled elastomeric compounds based on nitrile-butadiene rubber were obtained using a rubber-mixing mill. The vulcanization of elastomeric compounds was carried out at 170 °C for 10 min, the vulcanized composites were subjected to further carbonization at 360 °C; the carbonization cycle was 12 h. The microstructure, thermal properties and mechanical behavior of such materials, their thermal and deformation properties in the temperature range up to 300-320 °C are investigated.

**Keywords:** Composite materials Carbon materials, Silicon carbide

**1. Introduction**

The development of new composite materials, especially polymer-based composites, is one of the promising methods that allow obtaining new materials with improved operating properties. The use of carbon fillers, including carbon fibers, carbon nanotubes, graphite, etc. opens up new possibilities for improving mechanical, tribological, and thermal properties of composites [1–3]. In our previous work [4] the composites based on elastomeric compounds reinforced with high-carbon content fillers, such as carbon black (CB), discrete (chopped) carbon fibers (CF), and carbon nanotubes (CNTs) and subjected to further low-temperature carbonization were proposed. It was found that in contrast to traditional carbon-

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