

عنوان مقاله:

Thermal Sherlock additive for industrial pumps and electromotors based on nanodiamond and mining equipment

محل انتشار:

هفتمین کنگره ملی شیمی و نانو شیمی از پژوهش تا توسعه ملی (سال: 1403)

تعداد صفحات اصل مقاله: 7

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خلاصه مقاله:

Nano diamond particles with various filling ratios were added into the commercial high-temperature vulcanized silicon rubber composites, which were originally designed for high-voltage outdoor insulators. Their microstructures and electrical, thermal, mechanical, dielectric, and hydrophobic properties were systematically studied. Our results show that the Nano diamond filler improved slightly the electrical breakdown strength, i.e., from ۱۶.۲ kV/mm for the unfilled sample to ۱۷.۱ kV/mm for ۰.۹ vol%-filled sample, and the thermal conductivity was increased from ۰.۴۵ W/m K for the unfilled sample to ۰.۵۰ W/m K for ۱.۸ vol%-filled sample. Moreover, the hydrophobic properties were also improved with the contact angle at room temperature increased from ۹۱.۲ for the unfilled sample to ۱۰۲.۶ for the ۱.۸ vol%-filled sample. However, the mechanical properties were deteriorated by these fillers, i.e., decrease of the tensile strength, tear strength, etc. The dielectric constants were found to increase first with the filling fraction and then decrease. Possible mechanisms responsible for the improvement or deterioration for specific properties of the composites are discussed.

کلمات کلیدی:

Thermal, Sherlock, electromotors, nanodiamond, equipment

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