

Electromagnetic absorption shielding of rubber magnetic composites

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Abstract.

Electromagnetic radiation is emitted from a number of appliances used in everyday life (laptops, TV sets, mobile phones, microwave ovens and other commonly used electronic devices). Electromagnetic radiation waves from these devices can interfere with other electronic appliances, which leads to the lowering of their efficiency, in some cases even to their malfunctions. The acting of these factors can also affect functions of human body, mainly when organisms are subjected to their exposition for longer time. Therefore the need electromagnetic radiation shielding of electronic and radiation sources has become more and more actual and it is very perspective sphere of research and development.

Application of magnetic soft ferrites into the polymer matrices leads to the preparation of materials with the effects of electromagnetic radiation shielding. Rubber magnetic composites tested in this work were prepared by incorporation of magnetic soft manganese-zinc ferrite into rubber matrix based on acrylonitrile butadiene rubber. The aim was to investigate the influence of magnetic filler content on the cross-linking, physical-mechanical and shielding properties of the rubber magnets. The results showed that although the tensile strength showed decreasing trend with increasing content of magnetic filler, the tested composites are able to efficiently shield the harmful electromagnetic radiation in the selected frequency range. The biggest preference of these materials is their ability to shield the electromagnetic radiation by absorption mechanisms.

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