

SILICONE COMPOSITES WITH RGO AND NANOSIZED ZINC OXIDE

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The development of advanced silicone composites involving graphene materials is an attractive area of research due to graphene's potential to improve the mechanical and functional properties of silicone. New formulations of silicone composites in the form of coatings on glass substrates were obtained with the participation of GO, RGO and ZnO additives. All newly obtained composites were investigated by XRD, SEM and TEM analysis. The presence of silicone rubber in all samples, as well as RGO and ZnO, was demonstrated by means of X-ray diffraction. Using the computer program QualX, the size of ZnO NPs in the composites was determined. By SEM, agglomerates of ZnO and RGO distributed over the compact silicon structure were observed. The microstructure of the well-separated carbon layers of RGO and elongated ZnO nanocrystals embedded in the silicon matrix was observed by TEM. From the selected area electron diffraction (SAED) study of a silicon composite with 5 % ZnO and 5 % ZnO/(5 %) RGO, a conclusion was made about the structure of the ZnO nanocrystallites and the type and parameters of the crystal lattice were determined. Using the agar diffusion method, the antibacterial activity of the obtained composites was determined against the bacteria *Escherichia coli* and *Staphylococcus aureus*.

Acknowledgments: Authors acknowledge the financial support of the National Science Fund of Bulgaria, Project KP-06-H27/17 17.12.2018

References

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Figure

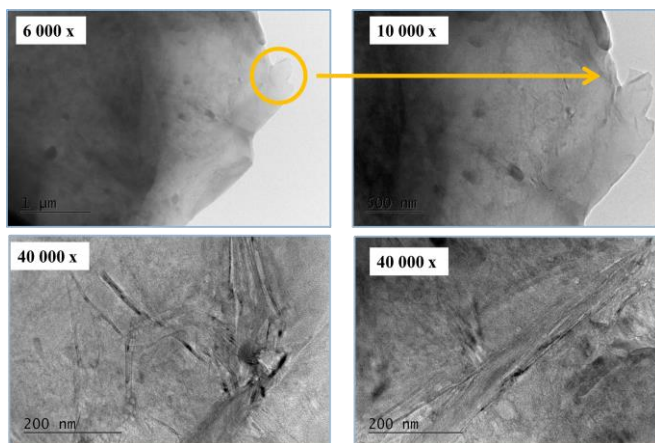


Figure 1: TEM images of silicone composite with 5 % RGO at different magnifications.