

Nanocomposite coatings technology

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The aim of the research is to inform about the formation of nanocomposite coatings. These coatings can be of wide use. His particular research has been carried out to extend the durability of the molds used to vulcanize rubber materials in the automotive industry. A base material in this case is an aluminum alloy, specifically Al-Si. This alloy is coated with a nanocomposite coating. In this case the PTFE coating, which can be used on its own, is enriched with nanoparticles based on titanium dioxide, tungsten carbide and aluminum oxide.

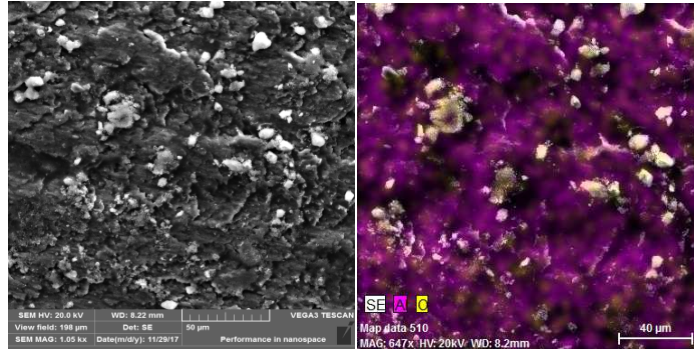


Fig. 1. Rated place of coating reached Al_2O_3

Fig. 2. Overall element map of coating reached Al_2O_3

As it was mentioned in the introduction, all the particles were prepared in a planetary ball mill, which has many advantages, such as financial variety, ecology, ecological disposal, relatively simple influencing of degradation of processes associated with high temperature, compatibility of immiscible mixtures. This type of mill can be not only used for mechanical grinding but also for mechanical alloying. Milling is to be held in a liquid atmosphere (colloid) or gaseous atmosphere (not affected – air, possibly with a particular gas).

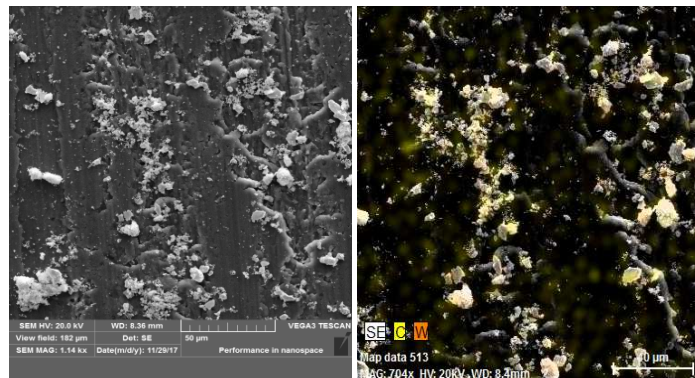


Fig. 1. Rated place of coating reached WC

Fig. 2. Overall element map of coating reached WC

This research was dealing with the technology of forming a nanocomposite PTFE coating enriched with titanium dioxide particles. This coating is subsequently confirmed by electron microscopy. It has been confirmed that clumps are clearly clogged in the coating and that they are evenly distributed. The coating was thus formed according to requirements.

In addition, two other coatings were created similar to the technology, namely PTFE and Al_2O_3 and PTFE and WC. With these two coatings the procedure is very similar to small differences. As with the previous type of coating, evaluation was performed on a scanning electron microscope.