

Control of operational properties of the structural materials using AFM and SEM methods

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In technology find widespread practical the use of string and string elements. In the field of measuring technology, there are many devices in which the sensitive elements are elements in the form of strings: strain gauges, accelerometers, crack meters, etc. String sensors are widely used due to its simplicity and low cost.

It is no secret that during the testing and operation of structural materials subject to various loads and stresses, structural materials "slowly" change their properties. A significant role is played by the measurement of degradation of the properties of structural materials in time during operation, metrological support of measurements, etc. [1]

The concept of the proposed study is based on the hypothesis that the rate of degradation can be significantly influenced by factors such as the topography of the surface, especially in the elemental and chemical compositions, which also need to be taken into account. The use of phase-chronometric method with the theory of reduction of measurements opens up new opportunities to study the behavior and degradation properties of structural materials, including elastic and rheological [2].

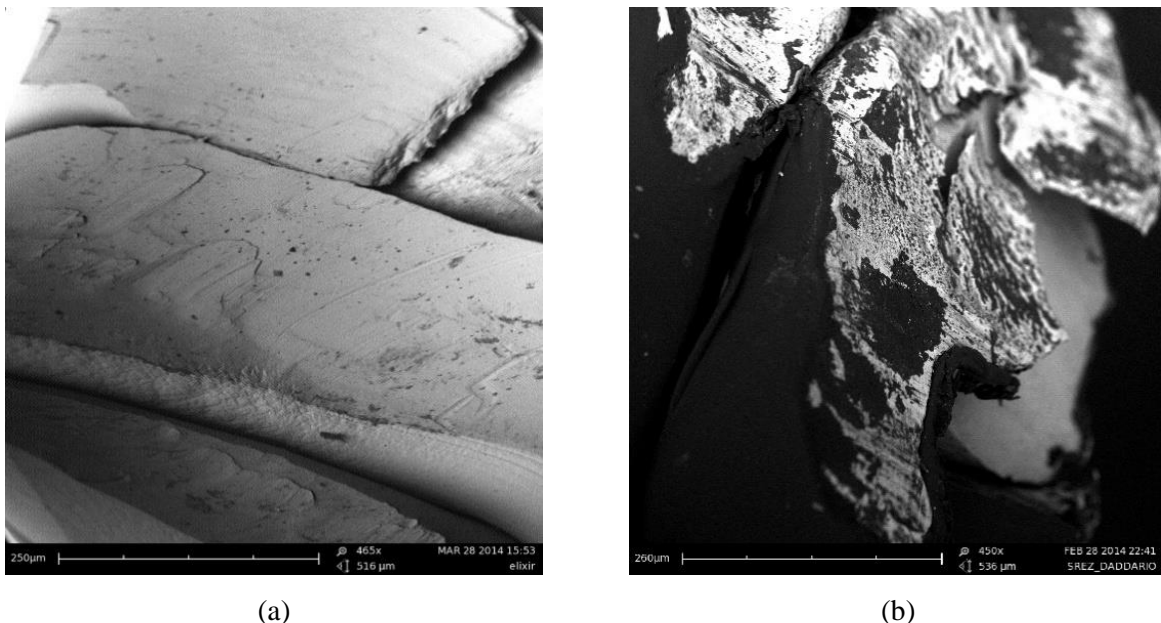


Figure 1. The surface of (a) the string Elixir PolyWeb and (b) the string D'addario EXP26 obtained by REM.

The paper presents the results of studies of the surface of the strings of various manufacturers by atomic force microscopy (AFM) and scanning electron microscopy (SEM), which provide the study of topography and surface structure. The results of elemental and chemical analysis by cattle, Auger spectroscopy, and IR spectroscopy are presented.

1. A.S. Komshin, S.R. Orlova, *Measurement Techniques* **59**, 589 (2016).
2. A.S. Komshin, *Measurement Techniques* **53**, 976 (2010).