**Formation and applications of nonstoichiometric titanium oxides and MXenes (Ti3C2Tx) nanostructures**

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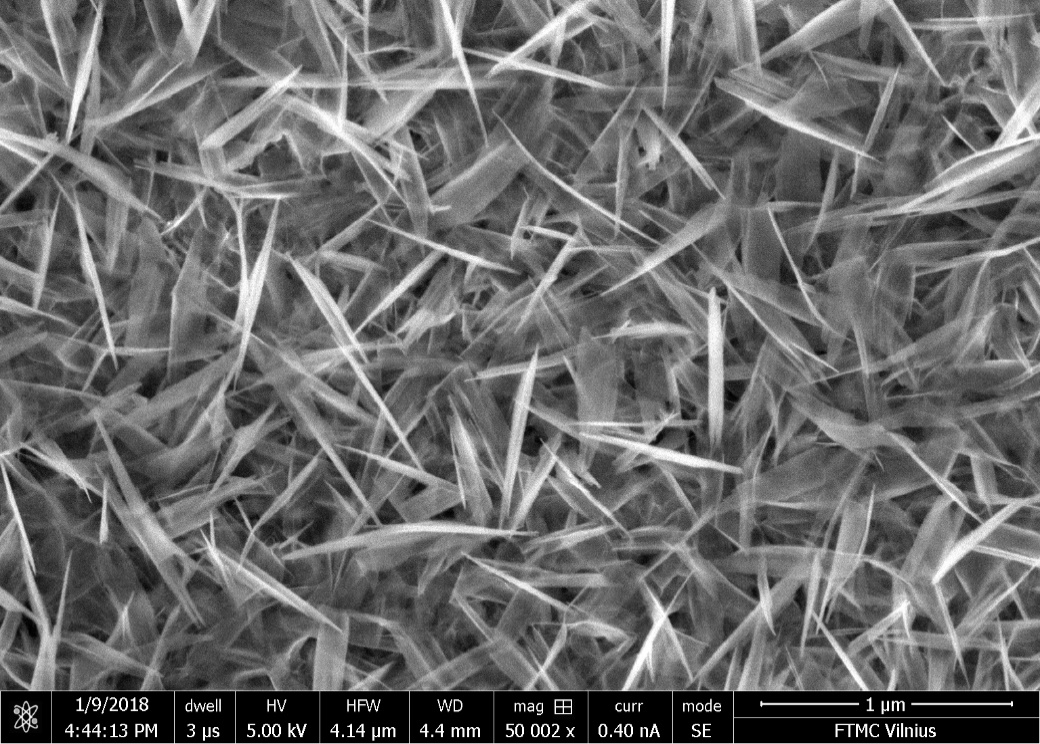
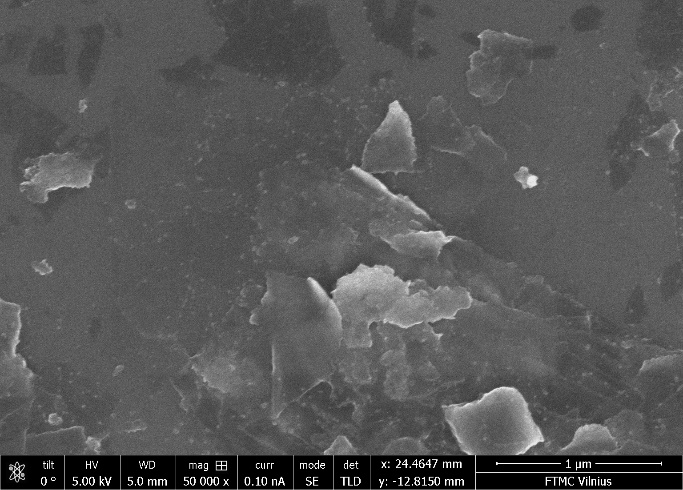
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In addition to stoichiometric TiO2, recently, various nanostructured non-stoichiometric titanium oxides, which by different authors are abbreviated as TiOn, or TiO2−x and Magnéli phases (TinO2n−1), have received significant attention in the development of various sensors [1]. Also, recent progress in the formation of optically active titanium carbides (Ti3C2Tx) so-called MXenes encourages applications of these new 2D materials in the design of sensors, bioelectronics and some breakthrough in these areas are foreseen. The advantageous properties of MXenes are suitable for biosensing applications but are not the limitation. The other important property of MXenes is their high and near metallic conductivity altered by their surface termination groups [2], leading to a possible application as supercapacitors [3], resistive sensors [4] and other applications in electrochemistry [5], electronics [6].

This research is dedicated to investigate new ways for non-stoichiometric titanium oxides and their based nanostructures formation by wet chemical methods and searching for new applications. The main focus is on gas and biologically active molecules sensors and catalysts for hydrogen evolution reaction.

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**A**

**B**

**500 nm**

**500 nm**

**Fig. 1.** SEM images of A – MXenes (Ti3C2Tx) sheets, B – TiOx nanostructures.

**References**

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