

TiO₂ thin films for biosensors development

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Oxide thin films growing by chemical vapor deposition (CVD) techniques have been widely explored for a wide variety of applications. Most of these films are grown over specific substrates in order to obtain the desired structures [1,2]. In this work we report the fabrication of titanium dioxide (TiO₂) thin films by CVD method, using common commercial glasses as substrate, with the aim of developing good quality and low cost substrates for the use in biosensors, taking into account the very regular surfaces obtained and the fact that titanium performs covalent binding with proteins. (Figure 1) The TiO₂ films were characterized by scanning and transmission electronic microscopies (SEM and TEM), X-ray diffractometry, electrochemical and spectroscopic techniques. The obtained results strongly suggest that simple and cheap materials are very promising tools in the development of accurate and low cost biosensor devices.

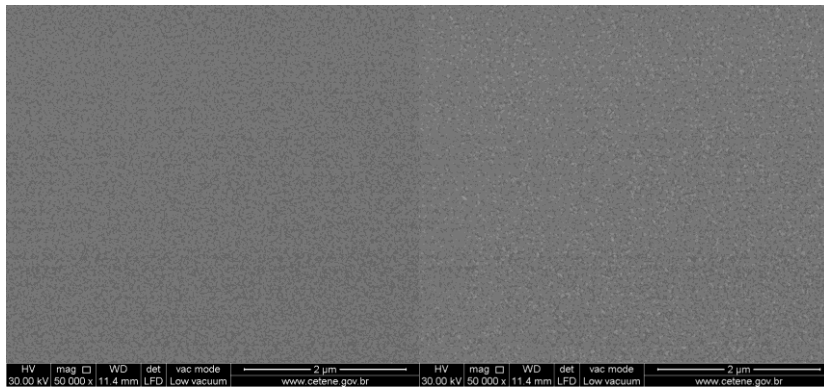


Fig. 1 - MEV of the nanostructure of TiO₂ in doped glass substrate Au. 50000x

Key words: Titanium dioxide, chemical vapor deposition, nanostructured materials, biosensors.

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[1] Sacilotti, M.; Cheyssac, P.; Patriarche, G.; Decobert, J.; Chiamonte, Th.; Cardoso, L. P.; Pillis, M. F.; Brasil, M. J.; Iikawa, F.; Nakaema, M.; Lacroute, Y.; Vial, J.C.; Donatini, F. Organometallic precursors as catalyst to grow three dimensional micro/nano structures: spheres, clusters & wires. *Surface & Coatings Technology*, 2007.

[2] Cheyssaca, P.; Sacilotti, M.; Patriarche, G. Vapor-liquid-solid mechanisms: Challenges for nanosized quantum cluster/dot/wire materials. *Journal of Applied Physics*, 100, 044315, 2006.

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