IP Profile: Electrodeposition of Sol-Gel Films

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Yissum has developed a platform technology for thin film deposition. The electroplating method for preparing sol-gel thin films allows for the coating of complex shaped objects.

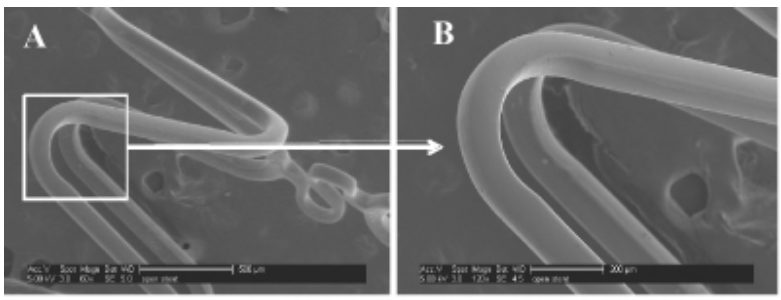
Organization: Yissum, Technology Transfer Company of the Hebrew University of Jerusalem, IL
Inventors: David Avnir and Daniel Mandler, Institute of Chemistry at the Hebrew University of Jerusalem, IL
Primary Market: Biotech & Medical
Technology Contact: Dana Gavish-Fridman, Yissum, IL

IP Overview Courtesy of Dana Gavish-Fridman, Yissum, IL

A novel electrochemical approach for the formation of sol-gel based nanocomposite materials was developed by professors David Avnir and Daniel Mandler of the Institute of Chemistry at the Hebrew University of Jerusalem. The approach is based on accelerating the deposition of sol-gel materials by applying a potential to a conducting substrate, which causes the change of pH. Moreover, this concept has been extended to involve the co-deposition of a wide variety of substances, such as metals, nanoparticles and polymers, together with the sol-gel matrix. Varying the potential allows to control the ratio between the matrix (sol-gel) and the nanostructured material inside.

This method has already been successfully demonstrated for various coatings, microelectronic conducting structures, and corrosion inhibition. The technology allows inclusion of other materials such as metals, polymers, nano-particles, and organic compounds. It also provides a superior coating method for complex shaped articles such as grids, stents, and springs. A range of new nanocomposites is envisaged and include graded materials, sophisticated films for lubrications, and photothermal absorbing layers.

The technology is patented and available for licensing.



Scanning electron microscopy (SEM) images of a sol-gel coated stainless steel stent after balloon expansion. The coating adheres extremely well to the surface and no cracks or delamination can be observed.