Atomic layer deposition in biomedical applications

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Abstract

Different from chemical vapor deposition (CVD) and physical vapor deposition (PVD), atomic layer deposition (ALD) is based on saturated surface reactions. In this case, the thin films are grown in a layer-by-layer fashion allowing sub-nanometer thickness control, low temperature depositions, good uniformity and superior step coverage on high specific surface area components compared to CVD and PVD. These advantages of ALD over other thin film deposition processes have been conventionally applied mainly in semiconductor electronic industry on the preparation of layers of outstanding High-K dielectric materials.
But, due to the advances in tool design and recipe development, the importance of ALD is rapidly expanding for producing innovative nanoscale materials.
ALD potential applications are highly multidisciplinar and specially, innovations brought by nanotechnology to biosciences, are proving to be good candidates to benefit from these potentialities. Applications of ALD in biomedicine cover from biosensors to tissue engineering and implantable devices.

References

[1] R. J. Narayan et al. Phil. Trans. R. Soc. A (2010) 368, 2033–2064