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POLYSACCHARIDE-BASED BLOCK COPOLYMERS: SYNTHESIS AND SELF-ASSEMBLY

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We present in this work the self assembly behaviour of new block copolymers based on polysaccharide. We have synthesised these systems with a new methodology using Dextran (T5 from Amersham, $\overline{M}_n=6600\text{g/mol}$ $I_p=1.6$) as a macroinitiator for the ATRP polymerisation of styrene [1]. Different block copolymer compositions were obtained from ~8% to 93% w/w in polystyrene.

Core shell micelle (~30nm) were obtained by direct dissolution in water for short PS block whereas self assembly of block copolymer with long PS block could be obtained and mastered by using mixture of organic solvent: DMSO, which is a good solvent for dextran and THF which is good for polystyrene.

Different morphologies could be obtained by adjusting the solvent mixture composition. Polymersomes (~150nm) can be obtained in THF and DMSO. Dynamic and static light scattering, SANS as well as AFM and TEM were used to characterise the obtained morphologies. (Figure 1-a,b)

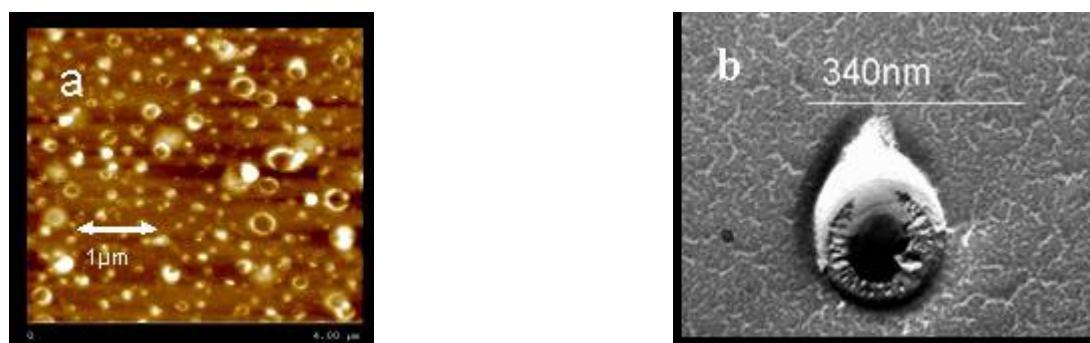


Figure 1 a) AFM image obtained in THF

b) TEM freeze fractured sample obtained in water

These polymersomes could be obtained in water from DMSO solutions by dialysis and characterized by the same technics, opening the field of numerous applications such as drug delivery.

[1] Houga, C.; Le Meins, J.-F.; Borsali, R.; Taton, D.; Gnanou, Y. *Chem. Commun.* **2007**, 3063-3065.