Molecular factories based on {M(2,2':6',2''-terpyridine)₂}²⁺-zipped co-block polymer vesicles

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We show how the chelating power of bis(2,2':6',2''-terpyridine)metal(II) complexes can be applied to 'zip' together co-block polymer vesicles to give pre-organized assemblies.¹ Different approaches have been used to functionalize polymer vesicles which condense with appropriately functionalized 2,2':6',2''-terpyridine (tpy) domains; sequential reaction with metal ions e.g. Fe²⁺ leads to an organized assembly. All reactions are carried out under ambient conditions and in aqueous media. The principle of the procedure is shown in the scheme below:



Figure 1: Strategy for assembly of arrays of coupled polymer vesicles.

The characteristic MLCT absorption associated with the ${Fe(tpy)_2}^{2+}$ chromophore is a powerful probe with which to assess the degree of vesicle aggregation. This along with AFM and TEM studies will be discussed.

The ordered structure of the polymer vesicle assembly provides a platform for an array of artificial compartments for a molecular factory. Surface modification is particularly attractive.² Future directions of the work will be discussed, e.g. encapsulation of components of the 'factory' within hollow vesicles and communciation between the compartments.

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[2] Langowska, K.; Kowal, J.; Palivan, C.G.; Meier, *W. J. Mater. Chem. B* **2014**, 2, 4684.