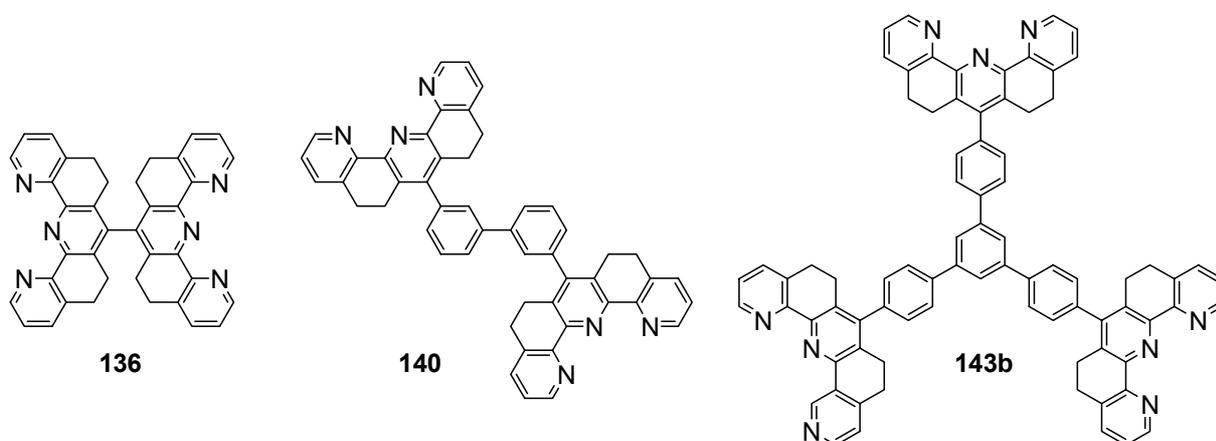


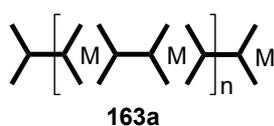
Oligotope Ligands and Nicotinonitriles –

Modern Applications of the Mannich Reaction in the Synthesis of Pyridine Derivatives

The immense application potential of mono-, bi-, ter- or oligopyridine derivatives in the field of nano-structured materials has recently led to the development of novel synthetic methods. Iminium salts and Mannich bases are versatile building blocks as they afford the synthesis of numerous pyridine derivatives by straightforward methods. In this thesis it could be shown, that bis- and tris-iminium salts are capable for synthesising ditope and tritope ligands (**136**, **140**, **143b**) in highly efficient procedures. Supplemented by Pd(0)-catalysed coupling reactions a huge variety of basic modules with special relevance for the design of supra-molecular structures can be allocated.



Starting from these terpyridine ligands different types of metal complexes were synthesised and their optical and electrochemical properties examined in detail. The behaviour of co-ordination polymers in solution was studied by the static light scattering technique considering compound



163a (M = Ni) as example. In respect of their application as molecular wires such structures are of outstanding interest.

The methodology for the synthesis of oligotope ligands was also used for reactions of conjugated β -enaminonitriles with ternary iminium salts. This proceeding enabled a highly efficient approach to functionalised nicotinonitriles (**173**, **181**, **184**). These derivatives could serve as important building blocks in the synthesis of natural products or pharmaceutical agents.

