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(54) **PSEUDOROTAXANES, ROTAXANES AND CATENANES FORMED BY METAL IONS TEMPLATING**

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See application file for complete search history.

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(57) **ABSTRACT**

A pseudorotaxane, a rotaxane and a catenane are provided. The pseudorotaxane includes at least a macrocyclic host molecule, a guest molecule, and a metal ion. The host molecule contains at least a binding unit and an aromatic linking spacer. The guest molecule has at least a recognition unit. The metal ion is used to template the threading of the guest molecule through the macrocycle host molecule by coordinating to a binding pocket formed from the binding unit of the macrocycle and the recognition moiety of the guest molecule. Rotaxanes or catenanes can be synthesized from the pseudorotaxane complexes, with or without the metal template ion in their molecular structures.

11 Claims, 24 Drawing Sheets