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Pillar[5]arenes bearing amide and carboxylic groups as synthetic receptors for alkali metal ions

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Abstract

© ISUCT Publishing. Pillar[5]arenes bearing amide and carboxylic groups have demonstrated recognition performance for some representative alkali metal ions including Li + , Na + , K + and Cs + in series cations of s- and d-metals compared to pillar[5] arenes with hydroxyl, methoxy and acetone fragments. Their complexation abilities toward these cations were evaluated by UV–Vis technique. The complexation results revealed that pillar[5] arene, containing glicylglicyne groups, were the most efficient cation receptors for Li + , Na + , K + and Cs + over other synthesized and studied pillar[5]arenes. Introduction of long glycylglycide fragments into macrocycle structure allowed to increase the association constant logarithm in the case of Li + by 2 orders. In addition, in the set of macrocycles, incorporation of the additional amide fragments and carboxyl group into macrocycle structure leads to increasing the binding efficiency with alkali metal cations.

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Keywords

Heterocycle, Macrocycle, Molecular recognition, Pillar[5]arene, Synthesis

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