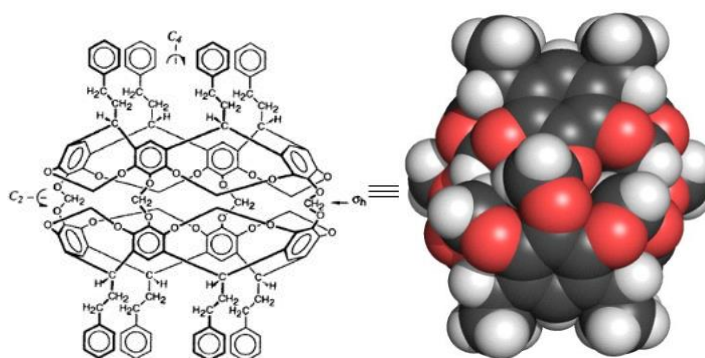


## Molecular containers: Enabling the challenging separation of radionuclides via entrapment

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We are seeking a highly motivated PhD candidate to explore molecular containers for the separation of radionuclides. The successful candidate will be employed by the University of Basel and will be enrolled in the graduate school of the Swiss Nanoscience Institute. This interdisciplinary project is carried out in the Tiefenbacher group (University of Basel, <https://nanocat.chemie.unibas.ch/en/>) and at the laboratory of radiochemistry (PSI, Villigen, <https://www.psi.ch/en/lrc>). This project first aims to construct novel molecular containers that are able to entrap metal ions. A molecular container is a host molecule that can bind a guest molecule. If the guest is completely surrounded by the container, and unable to escape, the container is called a 'carcerand' (see Fig. 1 for one example). Although several carcerands have been described in the literature, the entrapment of metal ions has not been studied.<sup>1</sup>

Figure 1



After the identification of suitable molecular containers, they will be explored for the separation of radionuclides in a subsequent step. The aim of this part is the introduction of a novel concept for the separation of radionuclides.<sup>2</sup>

### Your profile

Ideally, you are a well-trained organic chemist with a strong background in synthetic organic chemistry. You have performed multi-step synthetic sequences yourself before, can independently separate compounds via column chromatography, and characterize them via NMR techniques. Experience in radiochemistry is of advantage but not a prerequisite. Importantly, you are highly self-motivated.

We offer the opportunity to work on cutting-edge research in the field of molecular containers and radiochemistry. The successful candidate will have access to state-of-the-art facilities and resources, as well as the opportunity to collaborate with experts in the field.

Application via <https://nanoscience.unibas.ch/en/forschung/phd-programm/>. For further questions, you can contact Konrad Tiefenbacher ([konrad.tiefenbacher@unibas.ch](mailto:konrad.tiefenbacher@unibas.ch)) and Patrick Steinegger ([patrick.steinegger@psi.ch](mailto:patrick.steinegger@psi.ch)).

- (1) Warmuth, R.; Yoon, J. Recent Highlights in Hemicarcerand Chemistry. *Acc. Chem. Res.* **2001**, *34*, 95–105. <https://doi.org/10.1021/ar980082k>.
- (2) Schmidt, C. E.; Gajecski, L.; Deri, M. A.; Sanders, V. A. Current State of <sup>44</sup>Ti/<sup>44</sup>Sc Radionuclide Generator Systems and Separation Chemistry. *Curr. Radiopharm.* **2023**, *16* (2), 95–106.