

キャビタンド型ブレンステッド酸の開発と触媒性能の評価

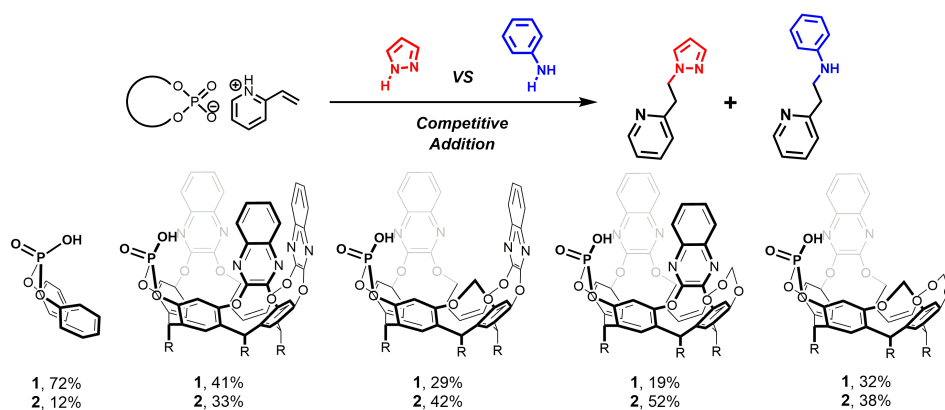
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Brønsted Acid-Typed Cavitands in Catalytic Use (*Ryukoku University*) ○Naruhiro Yoshida, Yasuhiro Matsumoto, Tetsuo Iwasawa

Four new quinoxaline-spanned resorcin[4]arene supramolecular cavitands endowed with a hydrogen phosphate group were synthesized. Evaluation of catalytic capability of these cavitands were studied in Brønsted acid-assisted conjugate addition reactions, reactions in which aniline and pyrazole competitively added to (2-vinyl)pyridine. The results were ranked with the control phosphate as well as among those four Brønsted acid-typed cavitands (**Scheme 1**). The structure-activity relationship revealed that the catalyst center surrounded by quinoxaline walls significantly influences reaction profile and product distribution. These would be enzymatic consequences inherent to such a limited space, which limits a transition-state geometry and stabilize reactive species.

Keywords : *Introverted functionality; Supramolecular catalysis; Cavitands; Artificial Enzymes; Brønsted Acid*

キャビタンドは酵素触媒と部分的に類似した構造的な特徴を示すため、キャビタンド触媒の開発研究が盛んに行われてきた¹⁾。我々はブレンステッド酸を持つキャビタンド触媒の開発を進めてきたが、今回ホスホン酸を有するレゾルシンアレン型キャビタンド四種類の合成に成功した。この四種類の触媒性能を調べたところ、ある種の共役付加反応において特徴的な超分子効果を見出した(**Scheme 1**)²⁾。このことは、キャビタンドのもつ分子内空隙が、遷移状態や反応中間体などを与える反応経路全体を安定化した結果であると考えられる。



Scheme 1. Product distributions in the competitive reaction.

- 1) N. Endo, M. Kanaura, M. P. Schramm, T. Iwasawa, *Eur. J. Org. Chem.* **2016**, 2514-2521.
- 2) Y. Matsumoto, Y. Taguchi, N. Yoshida, S. Tokai, T. Maruyama, T. Iwasawa, *Supramol. Chem.* **2021**, *in press* (DOI: <https://doi.org/10.1080/10610278.2021.1981323>).