



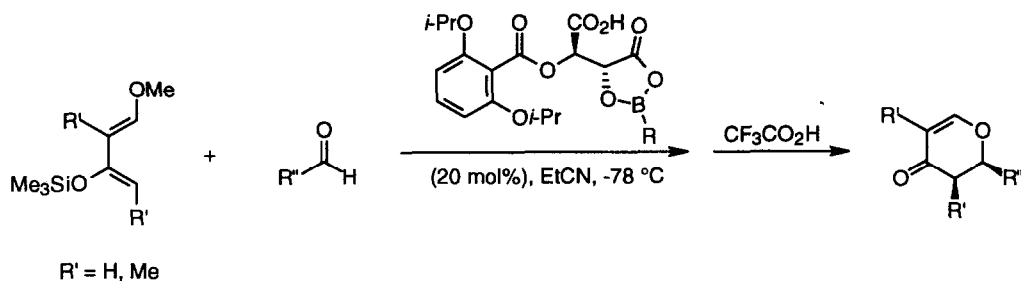
## Asymmetric Hetero Diels-Alder Reaction Catalyzed by Stable and Easily Prepared CAB Catalysts<sup>†</sup>

Qingzhi Gao, Kazuaki Ishihara, Tohru Maruyama, Makoto Mouri and Hisashi Yamamoto\*

School of Engineering, Nagoya University, Chikusa, Nagoya 464-01, Japan

Manuscript published in *Tetrahedron* 1994, 50, 979-988.

**Abstract:** A stable chiral (acyloxy)borane (CAB) complex is prepared *in situ* by mixing a tartaric acid derivative and different arylboronic acids at room temperature. A solution of the catalyst is effective in catalyzing hetero Diels-Alder reactions of electron rich dienes with conjugated aldehydes to produce dihydropyrone derivatives of high optical purities.



<sup>†</sup>Dedicated with respect to Professors Ryoji Noyori and K. Barry Sharpless on the occasion of the Tetrahedron Prize for 1993.