Asymmetric Strecker-Type Reaction of Nitrones Using Cyanohydrin

**Significance:** An asymmetric Strecker-type reaction of various nitrones with acetone cyanohydrin using a magnesium–(R,R)-tartramide complex was developed to successfully prepare optically active (S)-α-amino nitrile derivatives in excellent yield. Thereby, the acetone cyanohydrin serves as a less harmful and easy-to-handle synthetic equivalent of HCN and TMSCN.

**Comment:** The reaction mechanism is proposed to proceed as follows: first, the reaction of cyanohydrin and the (R,R)-tartramide with MeMgBr forms the corresponding bromomagnesium salts. The tartramide magnesium salt might be further deprotonated by DBU to form a magnesium ate-complex which coordinates the nitrone. Transfer of the cyano group from the cyanohydrin magnesium salt to the nitrone occurs from the re face, forming specifically the (S)-enantiomer.

**Selected examples:**

- $\text{Bn}^\text{NC}OH$: 80% yield, 89% ee
- $\text{Me}^\text{NC}OH$: 47% yield, 72% ee
- $\text{Ph}_{2}HC^\text{NC}OH$: 58% yield, 96% ee
- $\text{Bn}^\text{NC}OH$: 72% yield, 90% ee
- $\text{Bn}^\text{NC}OH$: 73% yield, 96% ee
- $\text{Ph}_{2}HC^\text{NC}OH$: 94% yield, 97% ee
- $\text{Ph}_{2}HC^\text{NC}OH$: 97% yield, 73% ee
- $\text{Bn}^\text{NC}OH$: 88% yield, 93% ee

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