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:**

- **Bn**
  - 80% yield
  - 89% ee

- **Me**
  - 47% yield
  - 72% ee

- **Ph**
  - 58% yield
  - 96% ee

- **Bn**
  - 72% yield
  - 90% ee

- **Ph₂HC**
  - 73% yield
  - 96% ee

- **Ph₂HC**
  - 94% yield
  - 97% ee

- **Ph₂HC**
  - 97% yield
  - 73% ee

- **Ph₂HC**
  - 88% yield
  - 93% ee

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