
Low-Valent Tungsten Redox Catalysis Enables Controlled Isomerization and Carbonylative Functionalization of Alkenes
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### Significance:
A tungsten-catalyzed isomerization of terminal alkenes to unactivated internal positions followed by subsequent hydrocarbonylation with CO is reported. This work addresses common challenges associated with the regioselectivity of tandem alkene isomerization/functionalization reactions.

### Comment:
Experimental and DTF studies were carried out to elucidate the mechanism. Key to this transformation is the six- to seven-coordinate geometry changes present in the W(0)/W(II) redox cycle and the presence of a conformationally flexible directing group that allows for isomerization to take place.

### Proposed reaction profile:

![Proposed reaction profile diagram](image)

### Selected examples:

- **Bn**
  - 79% yield, dr = 3:1
- **Pic**
  - 40% yield
- **Cl**
  - 76% yield
- **Br**
  - 65% yield
- **NBoc**
  - 93% yield
- **COO n-Bu**
  - 85% yield, dr > 20:1
- **Cl**
  - 65% yield, dr > 20:1
- **H**
  - 93% yield

### Mechanistic experiments:

- **stand. cond.**
  - 88% yield, >98% D retention
- **PhMe, 150 °C**
  - 90% D