Ruthenium-Catalyzed Z-Selective Cross-Metathesis of Allylic Alcohols

**Significance:** The authors describe a ruthenium complex catalyzed Z-selective cross-metathesis to afford (Z)-allylic alcohols. The reaction conditions are very mild and a wide range of functional groups (for example, aldehydes, carboxylic acids, phenols, and enol ethers) is tolerated.

**Comment:** Using a ruthenium–disulfide complex, highly valuable (Z)-alkenes are obtained from easily available alkenes and (Z)-allylic alcohols. Theoretical studies provide a better understanding of this catalyst design.

**Selected examples:**

- HO\(\text{C}_9\text{H}_19\) 72% yield \(Z/E = 96:4\)
- HO\(\text{OTBS}\) 65% yield \(Z/E = 93:7\)
- HO\(\text{CO}_2\text{Bn}\) 80% yield \(Z/E = 98:2\)
- HO\(\text{Cl}\) 68% yield \(Z/E = 98:2\)
- HO\(\text{C}_3\text{H}_11\) 80% yield \(Z/E = 94:6\)
- HO\(\text{CO}_2\text{H}\) 70% yield \(Z/E = 96:4\)
- HO\(\text{OMe}\) 63% yield \(Z/E = 92:8\)
- HO\(\text{Cl}\) 54% yield \(Z/E = 87:13\)

**Application to a formal total synthesis:**

- Ru complex 70% yield \(Z/E = 98:2\)
- Neopeltolide (antitumor)
- Leucascandrolide A (cytotoxic)

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