Enantioselective Allyl–Allylsilane Cross-Coupling Catalyzed by Iridium

**Significance:** An iridium-catalyzed cross-coupling of allylic alcohols with allylsilanes is reported. A series of chiral 1,5-diienes were prepared in good yields (up to 95%) with excellent regio- (up to >25:1) and enantioselectivities (up to >99% ee).

**Comment:** This allyl–allylsilane cross-coupling proceeds with excellent regio- and enantioselectivity under operationally simple conditions. The utility of this reaction is demonstrated in the enantioselective synthesis of the pyrethroid insecticide protrifenbute.

**Selected examples:**

- 2-Naph: 79% yield, >99% ee
- Ph: 87% yield, >99% ee
- MeO\(_2\)C: 65% yield, >99% ee
- F\(_3\)C: 61% yield, >99% ee
- 2-Naph\(^+\): 84% yield, 99% ee
- Br: 87% yield, >99% ee
- MeO\(_2\)C: 69% yield, >99% ee
- OAc: 87% yield, >99% ee

**Synthesis of (–)-protrifenbute:**

- Cl: 59% yield
- 9-BBN-H: 94% yield
- ZnEt\(_2\), CH\(_2\)I\(_2\), TFA: 94% yield
- Pd(dppf)Cl\(_2\), AsPh\(_3\): 59% yield
- 9-BBN: regioselectivity (9:1)

**Category:** Metal-Catalyzed Asymmetric Synthesis and Stereoselective Reactions

**Key words:** allylsilanes cross-coupling iridium