Aryl Sulfamate and Tosylate Cross-Coupling with Aryl Grignard Reagents

**Significance:** The authors report the first iron-catalyzed direct coupling of aryl sulfamates and tosylates with aryl Grignard reagents. Interestingly, fluoride counterions were found to increase the yields of the desired products. FeF₃ does not need to be reduced before the reaction, and in fact, reactions performed without the pre-reduction proceed better in almost all cases.

**Comment:** The reaction was shown to tolerate a number of iron pre-catalysts with no significant homocoupling of the aryl Grignard. Studies to understand the reaction mechanism better are underway.

**Selected examples:**

- \( \text{R} = \text{Ts}, \text{SO}_2\text{NMMe}_2 \)

  - 72% yield
  - 90% yield
  - 80% yield
  - 46% yield
  - 70% yield
  - 87% yield

**Reaction scheme:**

\[
\text{FeF}_3 \cdot 3\text{H}_2\text{O} \quad \text{(cat.)} \\
\text{IPr} \cdot \text{HCl} \\
\text{THF, reflux} \\
\text{ArMgBr or MeMgBr} \\
\text{FG} \\
\text{up to 94% yield}
\]