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Total Synthesis of (±)-Paeoniflorigenin and Paeoniflorin

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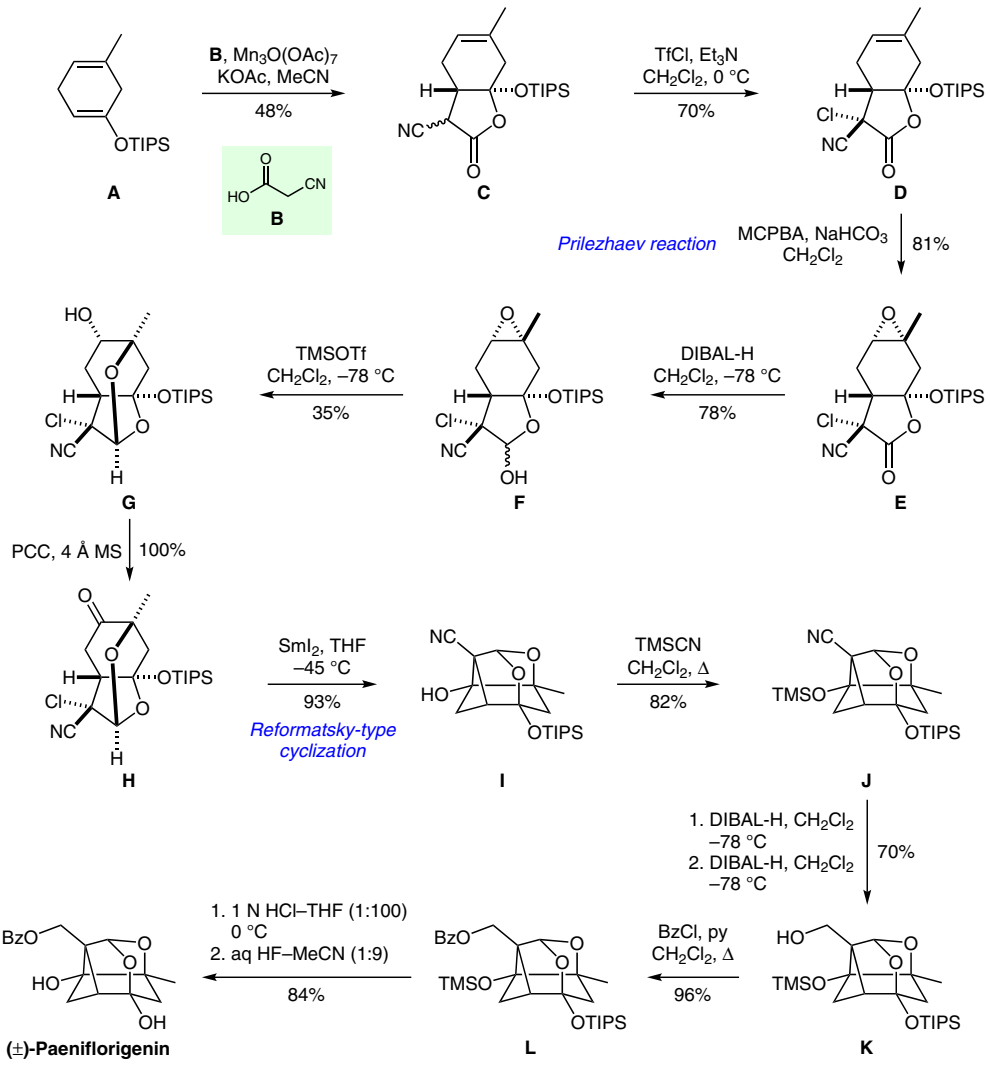
Synthesis of (±)-Paeoniflorigenin



Significance: In 1993, Corey and Wu reported the synthesis of (±)-paeoniflorigenin, a natural product from the roots of *paenia lactiflora*, which are widely used in traditional Chinese medicine. The approach relies on oxidative annulation of dihydro-*m*-cresol ether **A** and SmI_2-induced, Reformatsky-type cyclization from an α-chloro nitrile.

Comment: The synthesis commenced with annulation of **A** and **B** to give γ-lactone **C**. Chlorination followed by Prilezhaev epoxidation yields **E**. Cyclization is achieved by treating lactol **F** with an excess of TMS-triflate. Exposure of **H** to SmI_2 leads to formation of the carbon skeleton of paeniflorigenin. Protection of the secondary alcohol followed by reduction of the nitrile gives **K**. Benzoylation and global deprotection completed the total synthesis of (±)-paeniflorigenin in 13 steps from **A**.

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