Efficient Asymmetric Synthesis of Prostaglandin E_1

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A simple synthesis of prostaglandin E_1 (PGE_1) is described. The key steps are an asymmetric Michael addition to establish the desired (*R*)-configurations at C8 and C12 of the 2-(trimethylsilyl)ethoxymethyl- (SEM) protected PGE_1 and its one-pot deprotection with magnesium bromide in high yield. This method is potentially useful for the preparation of other modified prostaglandins.

Key words: Prostaglandin, Asymmetric Michael Addition, Cuprates, Deprotection