Oxidative Esterification of Primary Alcohols with a Pd/Bi/Te Catalyst

Significance: Palladium on activated charcoal (Pd/C, 5 wt%, purchased from Sigma-Aldrich) in combination with Bi(NO₃)₃·5H₂O and Te catalyzed the aerobic oxidative esterification of primary alcohols to give the corresponding methyl esters in 6–100% yield (32 examples, eq. 1).

Comment: In the absence of Bi(NO₃)₃·5H₂O and Te, the oxidative esterification of 1-octanol gave methyl octanoate in 16% yield. The catalytic activity of palladium on activated charcoal was superior to that of palladium on carbon and alumina (purchased from Sigma-Aldrich).

Typical results:

- 92% yield
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- 76% yield
- 70% yield
- 6% yield
- 87% yield
- 100% yield
- 78% yield
- 82% yield
- 19% yield
- 92% yield
- 43% yield
- 62% yield
- 90% yield
- 87% yield
- 95% yield
- 90% yield
- 85% yield
- 70% yield