A facile one-step conversion of aromatic aldehydes to acetates

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Received 4 April 1998; accepted (revised) 18 May 1999

Aromatic aldehydes are efficiently converted to the corresponding benzyl acetates with acetic anhydride and zinc in the presence of acidic aluminium oxide in dichloromethane at room temperature.

Conversion of aldehydes to acetates is an important and time saving reaction in organic chemistry which generally involves a two-step reaction—the first step is the reduction of aldehydes to the corresponding alcohols. Aromatic aldehydes were directly converted to the acetates by Brieger et al. with Ac₂O and FeCl₃ in the presence of 10% Pd/C catalyst at reflux temperature in cyclohexene. To our knowledge there is no other method available in literature for one-step conversion of aromatic aldehydes to acetates.

We report herein an efficient system, consisting of Ac₂O, Zn and acidic Al₂O₃, for one-step conversion of aromatic aldehydes to acetates at room temperature. The advantages of the system are: (i) the reagents are readily accessible and cheap, (ii) the reaction is carried out at room temperature, (iii) yields are quite satisfactory. This method therefore, provides a facile and mild approach for one-step conversion of aromatic aldehydes to acetates (cf. Table I). The possible mechanism is shown in Scheme I.

Experimental Section
General. Products were purified by TLC and

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<th>Reaction Period (hr)</th>
<th>Yield (%)</th>
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Table I—Reductive acetylation of aldehydes with $\text{Ac}_2\text{O-Zn-Al}_2\text{O}_3$

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<tr>
<th>Entry</th>
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<td>$\text{Cl-CH}_2\text{OAc}$</td>
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$^a$ Structures of all the products were supported by their $^1\text{H}$ NMR IR and MS data.

$^b$ Yields refer to the isolated products of >98% purity.

Conversion of aldehydes to acetates: General procedure
A mixture of an aldehyde (1 mmole), zinc powder (980 mg, 15 mmole), acetic anhydride (1 mL), acidic aluminium oxide (408 mg, 4 mmole) in dichloromethane (10 mL) was stirred at room temperature in a stoppered flask. After completion of the reaction (monitored by TLC), the reaction mixture was diluted with dichloromethane (100 mL) and filtered. The filtrate was washed with water ($5 \times 50$ mL) and dried over anhyd. sodium sulphate and evaporated under reduced pressure to furnish the corresponding acetate which was purified by chromatography. Typical examples are compiled in Table I.

Acknowledgement
The author thanks the Director, Regional Research Laboratory, Jorhat for providing necessary facilities.

References