

Note

A facile one-step conversion of aromatic aldehydes to acetates

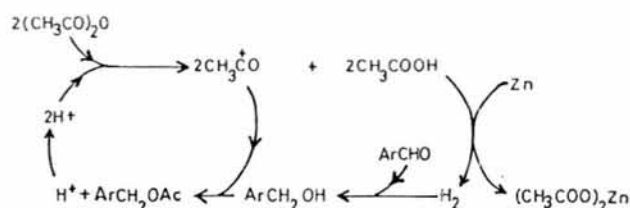
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Aromatic aldehydes are efficiently converted to the corresponding benzyl acetates with acetic anhydride and zinc in the presence of acidic aluminium oxide in dichloromethane at room temperature.

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^{1,2}. Aromatic aldehydes were directly converted to the acetates by Brieger *et al.*³ 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.



Scheme I—Possible mechanism for reductive acetylation of aromatic aldehydes.

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**.

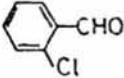
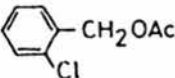
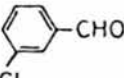
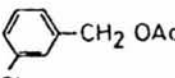
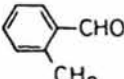
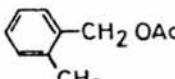
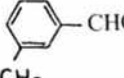
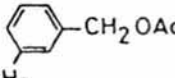
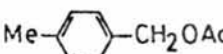
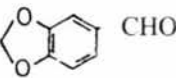
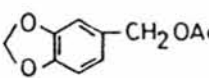
Experimental Section

General. Products were purified by TLC and

Table I—Reductive acetylation of aldehydes with Ac₂O-Zn-Al₂O₃

Entry	Aldehydes	Products ^a	Reaction Period (hr)	Yield ^b (%)
1			12	95
2			12	92
3			13	93
4			12	91
5			12	95

Table I—Reductive acetylation of aldehydes with $\text{Ac}_2\text{O-Zn-Al}_2\text{O}_3$

Entry	Aldehydes	Products ^a	Reaction Period (hr)	Yield ^b (%)
6			14	93
7			12	95
8			15	92
9			15	94
10			15	91
11			14	93

^a Structures of all the products were supported by their ¹H NMR IR and MS data.

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

preparative TLC (silica gel, E. Merck). ¹H NMR spectra were recorded on a Varian 360L instrument at 60 MHz with CDCl_3 as solvent and TMS as internal standard, IR spectra were recorded on a Perkin-Elmer 237B instrument in chloroform. Mass spectra were recorded on a Finigan MAT INCOS 50 instrument.

Conversion of aldehydes to acetates: General procedure A mixture of an aldehyde (1 mmole), zinc powder (980 mg, 15 mmoles), acetic anhydride (1 mL), acidic aluminium oxide (408 mg, 4 mmoles) 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 × 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

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References

- 1 Baruah R N, *Tetrahedron Lett*, 33 **1992**, 5417 and references cited therein.
- 2 Baruah R N, *Indian J Chem*, 33B, **1994**, 182.
- 3 Brieger G, Nestrick T J & Fu T H, *J Org Chem*, 44, **1979**, 1876.