



Synthetic Communications: An International Journal for Rapid Communication of Synthetic Organic Chemistry

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/lsyc20>

Rapid Regeneration of Carbonyl Compounds from Tosylhydrazones with Thallium Trinitrate(TTN)

Junquan Wang^a, Jianlong Lin^a, Ying Zheng^a & Jinfeng Huang^a

^a Department of Chemistry, Fujian Normal University Fuzhou, 350007, P. R. China

Published online: 22 Aug 2006.

To cite this article: Junquan Wang, Jianlong Lin, Ying Zheng & Jinfeng Huang (1997) Rapid Regeneration of Carbonyl Compounds from Tosylhydrazones with Thallium Trinitrate(TTN), *Synthetic Communications: An International Journal for Rapid Communication of Synthetic Organic Chemistry*, 27:15, 2583-2586, DOI: [10.1080/00397919708004127](https://doi.org/10.1080/00397919708004127)

To link to this article: <http://dx.doi.org/10.1080/00397919708004127>

PLEASE SCROLL DOWN FOR ARTICLE

Taylor & Francis makes every effort to ensure the accuracy of all the information (the "Content") contained in the publications on our platform. However, Taylor & Francis, our agents, and our licensors make no representations or warranties whatsoever as to the accuracy, completeness, or suitability for any purpose of the Content. Any opinions and views expressed in this publication are the opinions and views of the authors, and

are not the views of or endorsed by Taylor & Francis. The accuracy of the Content should not be relied upon and should be independently verified with primary sources of information. Taylor and Francis shall not be liable for any losses, actions, claims, proceedings, demands, costs, expenses, damages, and other liabilities whatsoever or howsoever caused arising directly or indirectly in connection with, in relation to or arising out of the use of the Content.

This article may be used for research, teaching, and private study purposes. Any substantial or systematic reproduction, redistribution, reselling, loan, sub-licensing, systematic supply, or distribution in any form to anyone is expressly forbidden. Terms & Conditions of access and use can be found at <http://www.tandfonline.com/page/terms-and-conditions>

RAPID REGENERATION OF CARBONYL COMPOUNDS FROM TOSYLHYDRAZONES WITH THALLIUM TRINITRATE (TTN)

Junquan Wang^{*}, Jianlong Lin, Ying Zheng and Jinfeng Huang

Department of Chemistry, Fujian Normal University
Fuzhou, 350007, P. R. China

Abstract: Tosylhydrazones can be rapidly converted into corresponding carbonyl compounds in good to excellent yields with thallium trinitrate (TTN) under mild conditions.

Tosylhydrazones, which are a class of highly crystalline compounds, can be used for the purification and characterization of aldehydes and ketones. The conversion of tosylhydrazones into corresponding carbonyl compounds is a useful transformation. As a result, a number of methods have been developed for this purpose. Among these, many were based on the oxidative cleavage of

^{*} To whom correspondence should be addressed

tosylhydrazones with various oxidizing agents such as $(\text{Bu}_4\text{N})_2\text{S}_2\text{O}_8^{[1]}$,

$\text{Cu}(\text{NO}_3)_2/\text{SiO}_2^{[2]}$, $\text{PhI}(\text{OAc})_2^{[3]}$, $\text{Ts-1}/\text{H}_2\text{O}_2^{[4]}$, $\text{Na}_2\text{CO}_3 \cdot \frac{3}{2}\text{H}_2\text{O}_2^{[5]}$,

etc.. Recently, a novel method has been reported for the hydrolysis of tosylhydrazones to their corresponding carbonyl compounds.^[6]

Thallium trinitrate (TTN) is a versatile oxidizing agent.^[7] It has been extensively applied to organic synthesis over the last two decades. A·Mckillop et al have reported the oxidative cleavage of oximes, semicarbazones and phenyl hydrazones with TTN. Herein we wish to report the conversion of tosylhydrazones into corresponding carbonyl compounds with TTN. In our experimental work, tosylhydrazones can be rapidly converted into parent aldehydes and ketones in good to excellent yields in MeOH under mild conditions. The carbon-carbon double bonds in α , β -unsaturated carbonyl compounds were not affected under reaction conditions. The reactions were completed in one to two minutes. Some results were summarized in Table.

Scheme

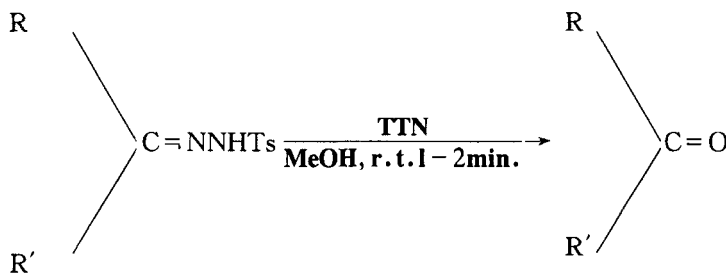
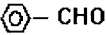
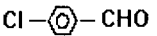

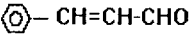
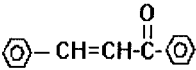
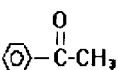
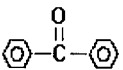

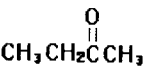


Table. Oxidative cleavage of tosylhydrazones with TTN.

| Entry | Product | Yield ^a (%) |
|-------|---|------------------------|
| 1 |  | 90 |
| 2 |  | 86 |
| 3 |  | 87 |
| 4 |  | 75 |
| 5 |  | 81 |
| 6 |  | 84 |
| 7 |  | 89 |
| 8 |  | 93 ^b |
| 9 |  | 91 ^b |

a. Yields of isolated products.

b. Yields determined by Gas Chromatography.

c. All tosylhydrazones were prepared by known method. ^[8]

d. Products were characterized by comparison of their melting points, IR and ¹H-NMR spectra with authentic samples.

General procedure for the oxidative cleavage of tosylhydrazones with TTN:

To a magnetically stirred solution of TTN (2mmol) in 5ml CH₃ OH in a 50ml round-bottom flask was added tosylhydrazone(1mmol) in one portion. The mixture was stirred for 1 – 2 minutes. The evolution of gas(N₂) and white

precipitate can be seen. Ether (30ml) was added to the reaction mixture. Organic layer was separated and then was washed with water (20ml \times 3). After being dried over anhydrous Na_2SO_4 , the solvent was removed under reduced pressure. the residue was then purified by preparative TLC on silica gel (hexane/acetate as eluent)

In view of good yield, short reaction time, simple operation and mild reaction conditions, the present procedure provides a useful method for the regeneration of aldehydes and ketones from tosylhydrazones.

Acknowledgement:

This work was supported by the Development Foundation of Fujian Normal University.

References

1. Chen, F. N. ; Yang, J. S. ; Zhang, H. ; Guan, C. S. ; Wan, J. L. ; *synth. Commun.* , **1995**, 25, 3163;
2. Lee, J. G. ; Hwang, J. P. ; *Chem. Lett.* , **1995**, 507;
3. Zeng, H. ; Chen, Z. C. ; *Synth. Commun.* , **1993**, 23, 2497;
4. Kumar, P. ; Hegde, V. R. ; Pandey, B. ; Ravindranathan, T. ; *J. Chem. Soc. , Chem. Commun.* , **1993**, 1553;
5. Narayna, C. ; Reddy, N. K. ; Kalbaka, G. W. *Synth. Commun.* , **1992**, 22, 2587;
6. Curini, M. ; Rosati, O. ; Pisani, E. ; Cosantino, U. ; *Synlett* , **1996**, 333;
7. Mckillop, A. ; *Pure Appl. Chem.* , **1975**, 43, 463;
8. Robert, O. H. ; Mark, K. ; Louis, R. ; *J. Org. Chem* , **1975**, 40, 924;

(Received in the UK 31 December 1996)