

Microwave Assisted Dihydroxylation of Olefins

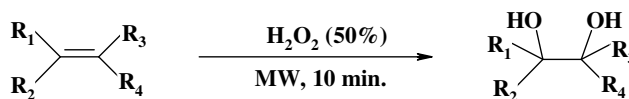
Kuladip Sarma, Nishi Bhati and Amrit Goswami*

Synthetic Organic Chemistry Division,

Regional Research Laboratory, Jorhat-785006, Assam (India)

Email: goswamia@rrljorhat.res.in

1,2-Dihydroxy compounds are important industrial compounds used as fragrant chemicals [1], photographic materials, lubricants, drugs and foods [2]. Generally both *syn* and *anti* 1,2-diols are prepared either from epoxides in presence of metal oxides or other acids and acidic reagents [3] or by dihydroxylation of olefins by potassium permanganate [4], osmium tetroxide [5] etc. However from the point of atom efficiency the performance of these reagents is very low [6]. In that context control use of hydrogen peroxide provide a better solution [7]. A less energy intrinsic solvent free condition for selective olefin dihydroxylation is therefore highly desirable. In our continuous effort for preparation of epoxides through a green oxidative pathway from olefins, we observed that 1,2-diols are formed on exposure of the different olefinic substrates to microwave in presence of hydrogen peroxide (50%) for 10 minutes in excellent yields (Scheme1). Details of the reaction have been discussed in the full paper.



Scheme 1

References

1. Y. Usui; K. Sato and M. Tanaka, *Angew Chem. Int. Ed.*, 42, 2003, 5623.
2. (a) J. I. Kroschwitz and M. Howe-Grant. Eds. *Kirk-Othmer Encyclopedia of Chemical Technology*, Wiley, Newyork, 1991. (b) K. Kulkaand, J. W. Ditrack, *Cosmet. Perfum.*, 90, 1975, 90.
3. (a) M. Hudlicky, *Oxidation in Organic Chemistry*, Am. Chem. Soc., Washington DC, 1990, 174. (b) A. H. Haincks, *Comprehensive Organic Synthesis*, First Edn., B. M. Trost and I. Fleming, Pergamon, Oxford, 1991, 437.
4. (a) G. Wagner, *Ber. Disch. Chem. Ges.*, 21, 1888, 1230. (b) A. J. Fatiadi, *Synthesis*, 1989, 85.
5. K. Akashi, R. E. Patermo, K. B. Sharpless, *J. Org. Chem.*, 43, 1978, 2063.
6. B. M. Trost, *Angew Chem. Int. Ed.*, 107, 1995, 285.
7. J. O. Metzger. *Angew Chem. Int. Ed.*, 110, 1998, 3145.

[Poster Presentation on the 9th National Symposium in Chemistry of Chemical Research Society of India (CRSI) at Delhi University from 1st February to 4th February, 2007.]