



## Chemistry of Dioxiranes

Posted on [Aug 29, 2011](#) in [News Category](#) by [admin0](#) [Comments](#)

My association with dioxirane chemistry started from January 1, 1983, at which stage dioxirane was considered an intermediate in some gas-phase reactions, dimethyldioxirane was considered as an intermediate that could be formed in situ, and a few mechanisms involving dioxirane intermediates have been discussed, disputed, and contradictory views existed about the stability of dioxiranes in relationship to some of its sister intermediates and isomeric structures. It all came to light in 1984 with my work in the laboratory of Professor R.W. Murray at St. Louis that dimethyldioxirane can be isolated as a solution.

I am even fortunate to have seen a few bright orange crystals of what I believe as dimethyldioxirane crystals at low temperature traps, though my attempts to get them out induced immediate decomposition.

I am also fortunate to have seen a deep yellow honey-like syrup of spirodioxirane at moderately low temperature from cyclohexanone that shot up the needle of a spectronic instrument to the extreme right and became clear before I could invite the attention of my colleague to share my astonishment.

I also had the great experience of producing copious amounts of dimethyldioxirane in a small fume hood in my laboratory in India, by an entirely different process, only to leave the whole area with dimethyldioxirane vapours that changed the moist start iodide papers kept at the other end of the 80-foot laboratory, the corridor and in the adjacent laboratories, dark brown in a few minutes. I did not have the capacity to induce my good students to take up the challenges in the new dioxirane world. Today I look back and guess that we could have made history if we had selected the different road in 1986 with my first two fellows, UPS and TR, excellent in their calibers, one becoming a great Scientist in a pharma company and the other quitting a similar pharma position to become a successful business man.

In the last 20 years the chemistry of dioxiranes has grown to such a level that a simple web search with words "dimethyldioxirane, or dioxirane, or dioxiranes" showed about 23000 web pages of which some 1000 are given below. This list taken from Google search is not complete and stands only as a set of samples. References to some of my own work are not here in the first 10 pages.

So, enjoy and get a taste of what this small ring peroxide looks like, and what it does.