International Journal of ChemTech Research
CODEN (USA): IJCRGG, ISSN: 0974-4290, ISSN(Online):2455-9555
Vol.10 No.5, pp 981-984, 2017

The Evalution Of antioxidant Activity of the (2*E*,2'*E*,2''*E*)-3,3',3''-(4,4',4''-NITRILOTRIS(BENZENE-4,1-DIYL))TRIS(2-NITROPROP-2-EN-1-OL)

M.N.Sivakumar*, M.Sivakumar, V.Balasubramanian

Department Chemistry, AMET University Chennai 603 112, India

Abstract : We have taken synthesized a novel class (2*E*,2'*E*,2"*E*)-3,3',3"-(4,4',4"-nitrilotris(benzene-4,1-diyl))tris(2-nitroprop-2-en-1-ol). *In vitro* antibacterial inhibitory activities of the nitropro-en-1-ol compound were determined by microdilution broth assay method using resazurin as an indicator. Determination of scavenging effect of DPPH was carried out with the nitropro-en-1-ol compound. In this method, a commercially available and stable free radical, DPPH (2,2Diphenyl -1- picrylhydrazyl), which is soluble in methanol was used.

Keywords : Baylis-Hillman adducts, paraformaldehyde imidazole and anthranilic. (2*E*,2'*E*,2"*E*)-3,3',3"-(4,4',4"-nitrilotris(benzene-4,1-diyl))tris(2-nitroprop-2-en-1-ol) and DPPH (2,2 Diphenyl -1- picrylhydrazyl).

Introduction

Nitroolefins are important molecules due to their unique chemical properties.[1] They possess a wide range of applications in organic, organometallic, medicinal, and material chemistry.[2](2*E*,2'*E*,2"*E*)-3,3',3"-(4,4',4"-nitrilotris(benzene-4,1-diyl))tris(2-nitroprop-2-en-1-ol)are useful building blocks in organic chemistry and can be tuned to exhibit important role in pharmacological application due to its stability towards light, moisture and oxygen.[3] This scaffold constitutes an interesting class of pharmacophores since it shows a remarkable resistance to metabolic transformations such as oxidation, reduction, basic or acidic hydrolysis.

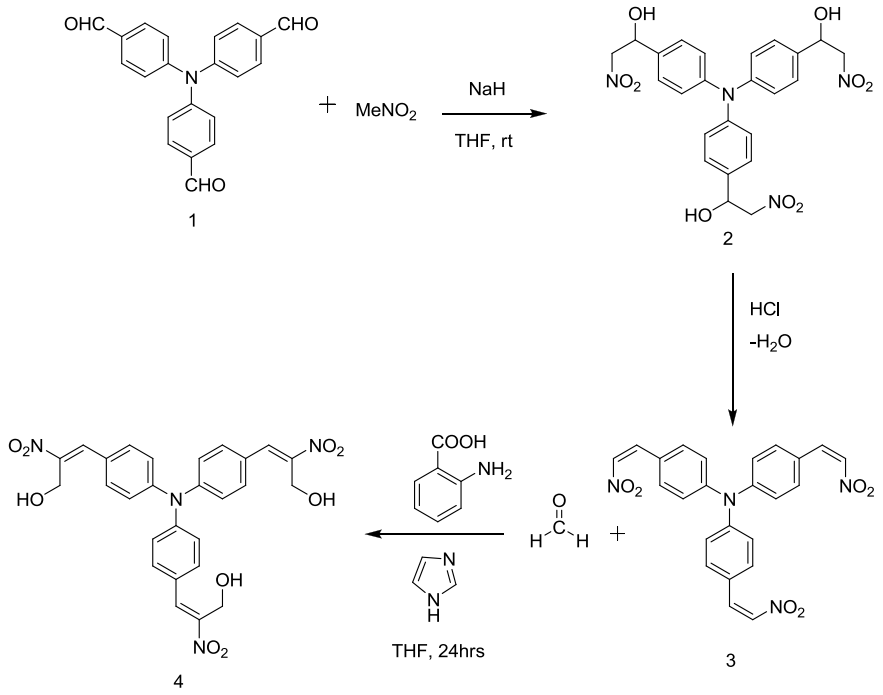
Conjugate addition of carbon nucleophiles to electron- poor alkenes is of paramount importance among the large body of synthetic processes devoted to carbon- carbon bond formation.[4-10] The first nucleophilic systems used for this purpose, more than a century ago, were stabilized carbanions that can be prepared in polar solvents from malonates and *â*-dicarbonyl derivatives in relatively mild conditions using bases of moderate strength.[11] This process is usually referred to as Michael addition, and ever since the number of carbanionic species that have been used for conjugate additions has considerably increased to include various enolate systems and strong nucleophilic species such as organometallic reagents. The utilization of these carbon nucleophiles has allowed the accomplishment of many synthetic processes with an outstanding degree of selectivity even though the related experimental procedures are often elaborated and not amenable to scale-up at the industrial level.pathways, thereby making understanding the mechanism of this reaction an intellectual challenge[12]. Conjugate additions using highly stabilized carbanions are still of interest since a growing number of these procedures can be carried out in environmentally benign solvents such as water and using catalytic amounts of the basic promoter. In addition, the achievement of diastereo- and enantioselective processes is no longer an exclusive domain of highly reactive carbanionic systems working in carefully controlled conditions

but can be nowadays conducted even at room temperature using easily available substrates and suitable base/solvent combinations.

Results and Discussion

To execute our idea, first we have chosen the 2*E*,2'*E*,2"*E*)-3,3',3"-(4,4',4"-nitrilotris(benzene-4,1-diyl))tris(2-nitroprop-2-en-1-ol)nitro olifen derivative[12] .

Scheme 1



Antioxidant

DPPH radical scavenging assay

The scavenging effect of DPPH was carried out with the 2*E*,2'*E*,2"*E*)-3,3',3"-(4,4',4"-nitrilotris(benzene-4,1-diyl))tris(2-nitroprop-2-en-1-ol)compound[13]. In this method, a commercially available and stable free radical, DPPH (2,2Diphenyl -1- picrylhydrazyl), which is soluble in methanol was used. An aliquot (25µl) of various samples was added to 1 ml of freshly prepared DPPH solution. Absorption was calculated after 20 min of incubation at 515 nm. Whereas Ascorbic acid used as location material.This performed in triplicate. Percentage of inhibition was calculated by the following equation.

$$\% \text{ of inhibition} = \frac{\text{ODc-ODt}}{\text{ODc}} \text{ X } 100$$

Results:

The DPPH radical is considered to be a model of lipophilic radical. A chain reaction in lipophilic radicals was initiated by lipid autooxidation.

Table 1.Anti oxidant activity (Minimum inhibitory concentration µg/ml) of 2*E*,2'*E*,2''*E*)-3,3',3''-(4,4',4''-nitrilotris(benzene-4,1-diyl))tris(2-nitroprop-2-en-1-ol)(in µM)

S.No	Nitroolefin and Nitro olcohal	DPPH radical scavengingassay (25µg/ml)
1	**3**	54.16 ± 2.804
2	**4**	54.11 ± 2.808

♥Ascorbic acid was used as a standard

Typical experimental procedure for the synthesis (2*E*,2'*E*,2''*E*)-3,3',3''-(4,4',4''-nitrilotris(benzene-4,1 diyl))tris(2-nitroprop-2-en-1-ol)[12]

The reaction mixture havingnitrostyrene**(2)** (1.40g, 10 mM) in THF (50 mL) at room temperature was added imidazole (1.91g, 1 equiv) followed by anthranilic acid (0.42g, 10 mol%). Aqueous formaldehyde (38%, 60 mL, excess) was then added and the reaction mixture was stirred at room temperature for 24 h. After completion of the reaction (confirmed by TLC analysis), the reaction mixture was concentrated. Then the reaction mixture was acidified with 5N HCl (20 mL) and the aqueous layer was extracted with ethyl acetate (3x25 mL). The combined organic layers was washed with brine (50 mL), dried over anhydrous Na_2SO_4 and concentrated in vacuo. The residue was purified by silica gel column chromatography eluting with EtOAc–hexanes.

Conclusion

Hence we have successfully determine Anti Oxidant for novel class of (2*E*,2'*E*,2"*E*)-3,3',3"-(4,4',4"-nitrilotris(benzene-4,1-diyl))tris(2-nitroprop-2-en-1-ol) andtris(4-((*Z*)-2-nitrovinyl)phenyl)amine.

Acknowledgments

We thank AMET University for the financial support. We also thank Indian institute of Technology, Chennai for Anti Oxidant studies.

References

1. Synthesis of Two Naturally Occurring 3-Methyl-2,5-dihydro-1-benzoxepin Carboxylic Acids,Seiji.Y, Nao T, Masahiro. M, Yoshiro. H,*Juornal of Organic Chemistry*, 2005, *70*, 7505-7511.
2. Blacks, G. P.; Dion, F.; Fratucello, S.; Murphy, P. J.; Nielsen, M.; Williams, H. L.; Walshe, N. D. A, Evidence for azidyl radical initiated olefin isomerization.One-way isomerization of (Z)-urocanic acid, Tetrahedron Letter. 1997, *38*, 8561-8564.
3. Basavaih, D.; Krishnamacharyulu, M.; SugunaHyma, R.; pandiyaraju, S.,The Friedel-Crafts reaction of the Baylis-Hillman adducts, *Tetrahedron Letter*. 1997, *38*, 2141-2144.
4. Shanmugan, P.; Baby, V.; Suchithra, M., Synthesis of Novel Functionalized 3-Spiropyrrolizidine and 3-Spiropyrrolidine Oxindoles from Baylis−Hillman Adducts of Isatin and Heteroaldehydes with AzomethineYlides via [3+2]-Cycloaddition,Organic, Letter, 2007, *9*, 4095-4098.
5. Blacks, G. P.; Dion, F.; Fratucello, S.; Murphy, P. J.; Nielsen, M.; Williams, H. L.; Walshe, N. D. A, Evidence for azidyl radical initiated olefin isomerization.One-way isomerization of (Z)-urocanic acid, Tetrahedron Letter. 1997, *38*, 8561-8564.
6. Park, D. Y.; Kim, S. J.; Kim, T. H.; Kim, J. N. Synthesis of substituted (*D*)-phenylalanine derivatives by regioselective reduction of enantiomerically pure *cis*-2,3-disubstituted aziridines *Tetrahedron Letter*. 2006, *47*, 6315-6318.
7. Jai Pio Deva Sahaya Das, Helen Merina Albert, Growth and characterization of organic crystals: Urea Lmalate and Zn(II) doped Urea L-malate International Journal of ChemTech Research,2016, 9 (1) 290-295, 2016.
8. MahaMohamed,ShaterAbd Allah, Hala Mohamed, Safwat El-Bassiouny, TarekAbdElfattahElewa, TalaatNagi El-Sebai, Effect of Salicylic Acid and Benzoic Acid on Growth, Yield and Some

Biochemical Aspects of Quinoa Plant Grown in Sandy Soil, International Journal of ChemTech Research, 2015, 8, (12), 367-374.

9. Ravichandran. S, Murugesan. C, Synthesis, Characterization and screening of antimicrobial activity of metal complexes derived from the Mannich base, N-[1-morpholino(4-diphenylaminobenzyl)]acetamide International Journal of ChemTech Research, 2015, 8 (12) 536-541.
10. Osmium-Catalyzed 7-endo Heterocyclization of Aromatic Alkynols into Benzoxepines Alejandro V.F, Cristina G.Y, Jesffls A. V, Miguel A. E, Angewanda Chemical. 2010, 49, 4278 –4281.
11. A. Faltin, C.; Fleming, E. M.; Connon, S. For the synthesis of Baylis-Hillman adducts of acrylamides, see: J. *Juornal of Organi Chemistry*. 2004, *69*, 6496-6499.
12. α-Hydroxymethylation of conjugated nitroalkenes via the Morita–Baylis–Hillman reaction, Rastogi, N.; Namboothiri, I. N. N.; Cojocaru, M. *Tetrahedron Lett*. 2004, *45*, 4745-4748.
13. Synthesis and evaluation of α-hydroxymethylated conjugated nitroalkenes for their anticancer activity: Inhibition of cell proliferation by targeting microtubulesBioorganic. Medicinal Chemistry. 2006, 14, 8073-8085

*****