

Physical Properties of Cyclestructure

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Abstract

Azo – cyclic derivatives are a part from a ring that has more than type of atoms. Nitrogen, oxygen and sulfur are often found along with carbon in heterocycles rings.

Heterocycles derivatives are common in chemical chemistry, and many have fulfilled important physiological active in plant and animal kingdoms and have an important biological properties, such as, the antibiotic penicillin, sedative phenobarbital, and sugar replacing reagent saccharin, all having heterocycles ring.

Keywords: Physical Properties, Cyclestructure,

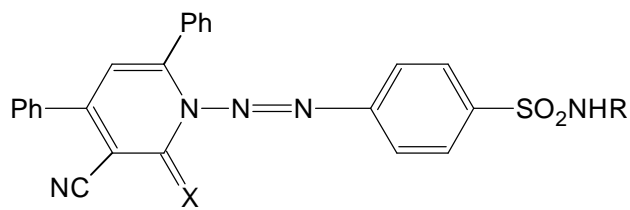
1.Introduction

The aromatic amine, dissolved in cold hydrochloric acid, is mixed with sodium nitrite, there is prepared a diazonium salt. Since azo salts slowly decompose even at (0 °C) -bath temperature the solution is used immediately after preparation⁽¹⁻⁵⁾.

The great number of reactions undergone by azonium salts may be divided into two classes: replacement, in which nitrogen is lost as N₂, and some other atom or group becomes attached to the ring in its place; and coupling, in which the nitrogen is retained in the product, to yield product of the general formula (Ar-N=N-Ar'), called azo compounds.⁽⁶⁾

Several methods have been used to synthesize azo compounds, such as⁽⁷⁻⁹⁾: (i) oxidation of hydrazine derivatives by HgO, or urea derivatives using t-butylhypochlorite (ii) Reaction of diazonium salt with phenols in the presence of NaOH at 0 °C. These methods seem to be the best because of the high yield of the azo compounds.

Diazonium coupling is one of the main route for the synthesis of sulfa drugs, such as sulfanamide, which has many therapeutic applications⁽¹⁰⁾. Some new azo sulfa drugs were synthesized by Abdel Hafeez and coworkers⁽¹¹⁾. They synthesized some new azo sulfa drugs such as compound [1] containing various heterocyclic moieties and their metal chelates to improve the biological properties.

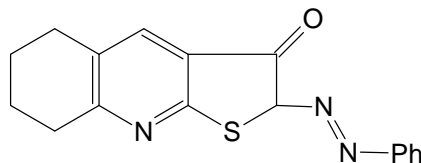


[1]

X = O, S

R = H, COCH₃,

Kamal El-Dean and coworkers⁽¹²⁾, achieved coupling of (2,3,5,6,7,8-hexahydrothieno[2,3-b]quinolin-3-one with aryldiazonium chloride to afford the corresponding arylazo derivative [2].

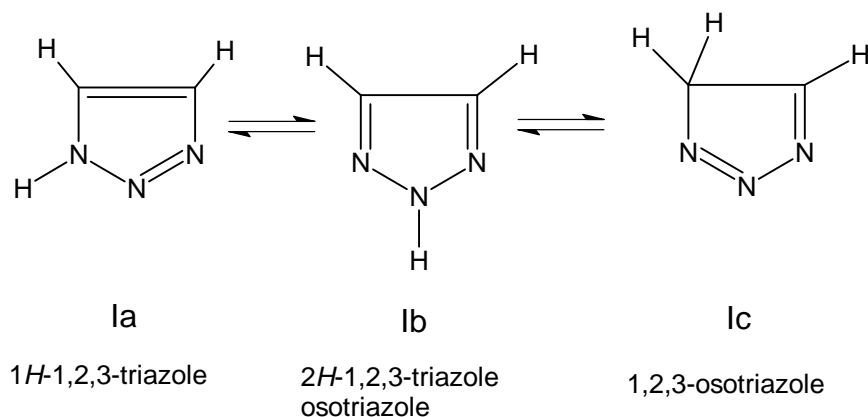


[2]

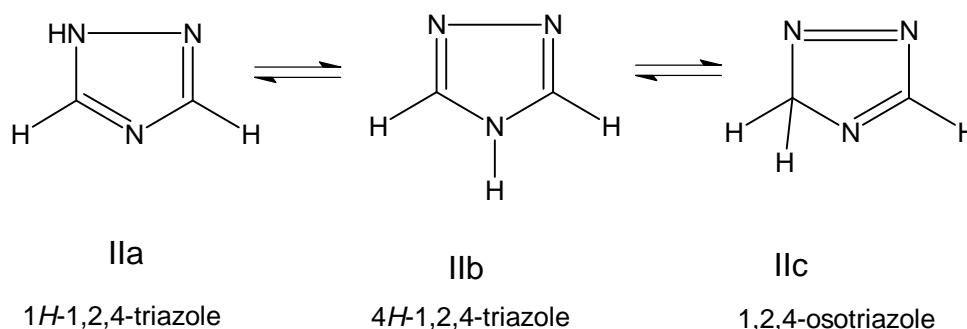
2. Triazoles

In five-membered ring systems, the presence of three nitrogen heteroatoms defines an interesting class of compounds, called triazoles which may be of two types; the 1,2,3-triazole (I) and the 1,2,4-triazoles (II)⁽¹³⁾. The former is originally called vicinal (vic) triazoles and the latter symmetrical (sym) triazoles.

The term oso-triazoles refers to derivatives of 2H-1,2,3-triazole particularly those prepared from osazones.



1,2,4-Triazoles are cyclichydrazidines with hydrogen atom or a substituent on either the hydrazide nitrogen 1 or on the amide nitrogen. The parent 1,2,4-triazole (1H form) is in tautomeric equilibrium with 1,2,4-triazole (4H form). The interconversion of the two tautomeric forms occurs rapidly and their separation is difficult⁽¹⁴⁾.



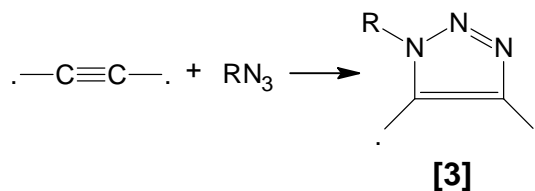
3. 1,2,3-Triazole

The 1,2,3-triazole unit is an important element in a number of drugs and development candidates. The triazole is a structural backbone of many antibiotics, antiallergics, antimetastasis agents and antidepressants⁽¹⁵⁾. Their synthesis usually started with azides which are considered a very important compounds due to their industrial as well as biological applications.

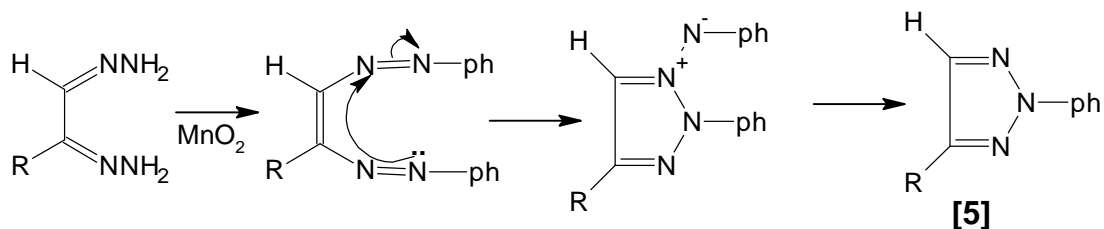
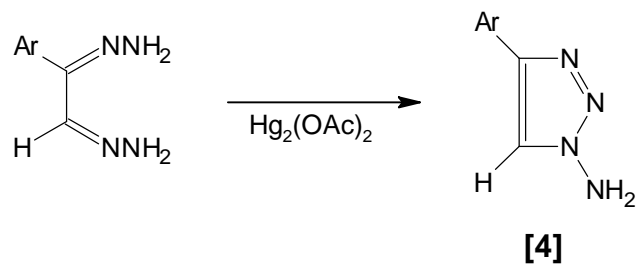
Organic azides are generally safe compounds, those of low molecular weights can be unstable and, therefore, difficult to handle⁽¹⁶⁾.

The chemistry of azides has thus attracted the attention of many chemists, since many of these compounds play an important role in organic chemistry.

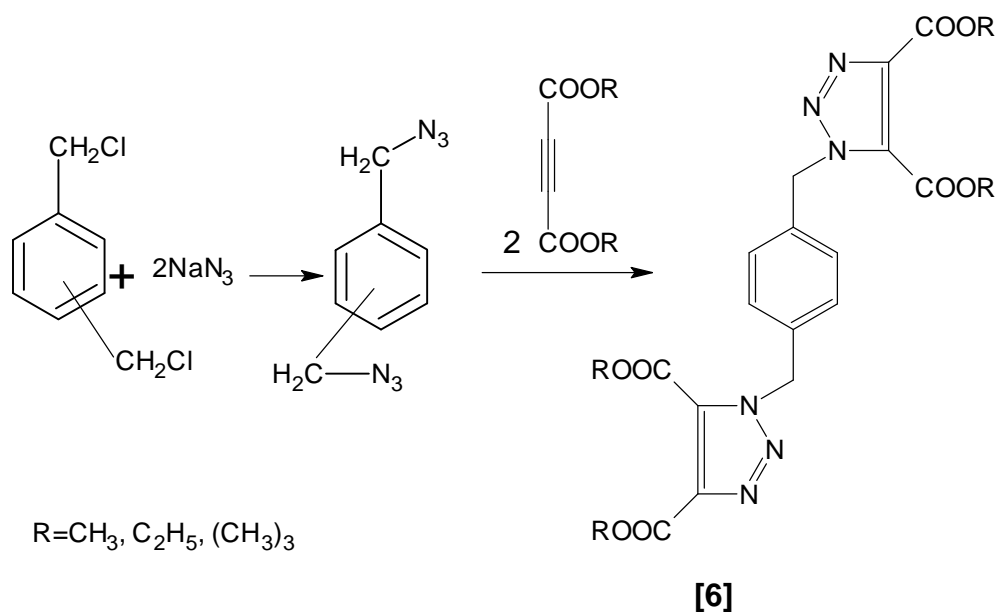
Several different methods have been described for synthesis of 1H-1,2,3-triazoles including the intermolecular cyclization of bishydrazones or mixed hydrazones, miscellaneous oxidations, as well as the 1,3-dipolar cycloaddition of a wide variety of organic azides to acetylenes (R=alkyl, vinyl, acyl, etc.)^(17,18) like compound **[3]**



Oxidative processes leading to N-N bond formation convert the hydrazone into the 1-amino1,2,3-triazole derivative **[4]** by $[\text{Hg}_2(\text{OAc})_2]$ or $[\text{MnO}_2]$, and synthesis of 2H-1,2,3-triazoles **[56]** from diketone bis-arylhydrazones^(19,20).

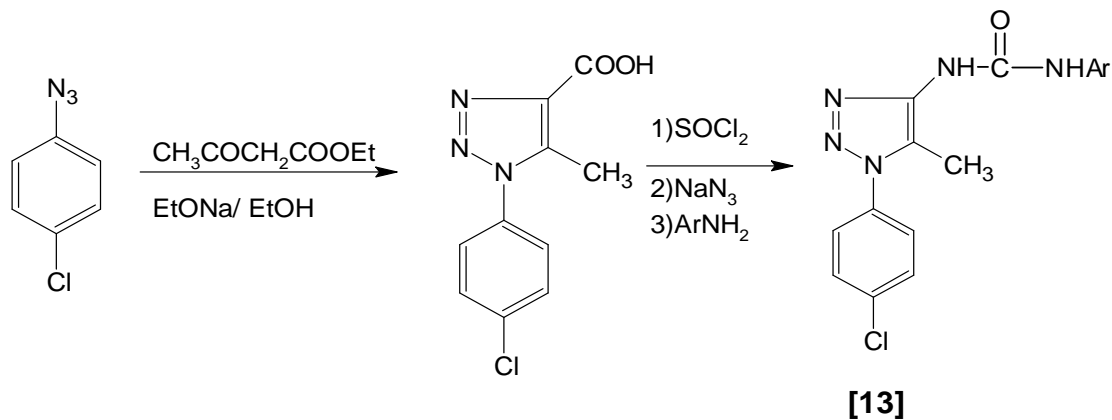


Abo-Orabi⁽²¹⁾, synthesized several triazole derivatives through 1,3-dipolar cycloaddition reactions of substituted benzyl azides with acetylenic compounds to form the corresponding 1,2,3-triazoles, like compound [6].

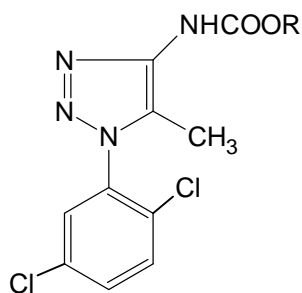


Recently, Kolb and coworkers⁽²²⁾, found a one step method for preparing a 1,2,3-triazole carboxylic acid compounds namely [7], [8], and [9] by treating an azide with different β -ketoesters in the presence of a base as shown in the following equation:-

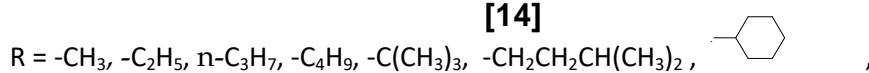
Moreover, Shan-Dong and coworker ⁽²⁴⁾, have prepared several new carbamide derivatives from 1,2,3-triazole like comund [13].



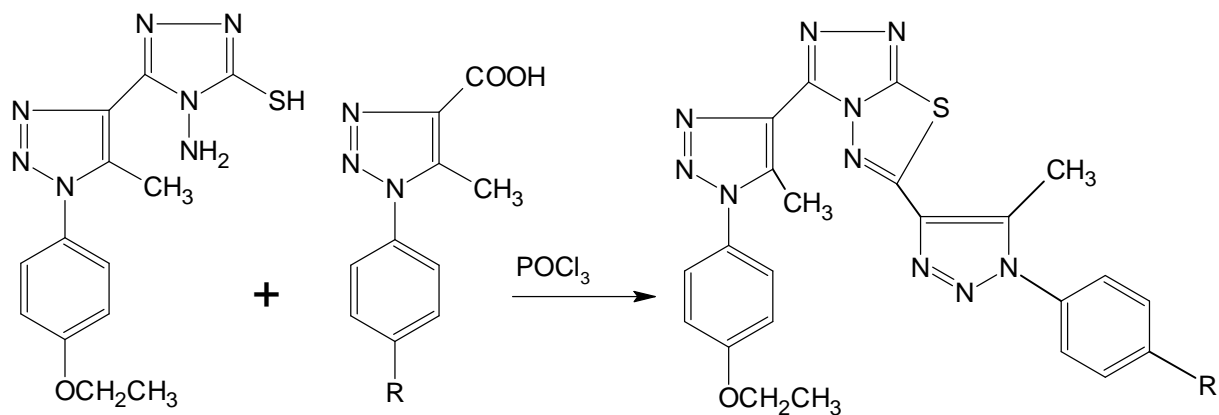
In addition Shan-Dong and his team ⁽²⁵⁾ have prepared of new carbamide acid ester derivatives [14].



[14]



Recently, Shan-Dong and Wang ⁽²⁷⁾, have prepared a new heterocyclic derivatives containing two 1,2,3-triazoles, 1,2,4-triazole and 1,3,4-thiadiazole nuclei, that is very interesting; in that there are six rings in the complex structure of the compound [15]; three rings are triazole rings and one is thiadiazole ring; as shown in the equation:-



[15]

R= 4-CH₃, 3-Cl, 4-Cl, 4-Br, 3-Br, 2,5-Cl₂, 4-CH₃O, 4-C₂H₅O

References

1. Mc Murry. John., '**Organic Chemistry**', 5th Edition, Cornel University press, (2002).
2. A.K.S.Gupta and K.Hajela, **J. Ind. Chem. Soc.**, LVII (1981) 690-1.
3. S. P. Suman and S. C. Bahel, **J. Ind. Chem. Soc.**, LVII (1980) 420-2
4. A. K. El-Shafei, Kh. M. Hassen, and H.S. El-Kashef, **J. Ind. Chem. Soc.**, 66 (1989) 120-1.
5. J. B. Henderickson, D. J. Cram, and G. S. Hammond, '**Organic Chemistry**', 3rd Edition, Mc-Grow-Hill Kogakusha, Ltd., p.489-490 (1970).
6. R. T. Morrison and R. N. Boyd '**Organic Chemistry**' 5th Ed., Prentice-Hall of India, p.976-81 (1989).
7. S. G. Cohen, S. J. Groszoz, and D. B. Sparrow, **J.Amer.Chem. Soc.**, 72 (1950) 3947.
8. J. S. Fowler, **J. Org. Chem.**, 37 (1972) 51.
9. L. R. Morgan and C. C. Aubert, **Proc. Chem. Soc.**, 73 (1962).
10. F. Freeman, D. K. Farquhar, R. L. Walker, **J. Org. Chem.** 33 (1968) 3648.
11. A. A. Abdel Hafez, I. M. Awad and A. A. Ragaa, **J. Chin. Chem. Soc.**, 40 (1993) 289-96.
12. A. M. Kamal El-Deen, R. Shaker, A. A. Abo El-Hassan and F. F. Abdel Latef, **J. Chin. Chem. Soc.** ,51 (2004) 335-45.
13. J. March, "**Advanced Organic Chemistry**" Ed., Jhon Wiely and Sons, New York, 741-45(1985).
14. R. M. Yousef and M. J. Searin, **J. Org. Chem.**, 67(26) (2002) 9340-45.
15. E. F. Scriven, K. Turnbull, **Chem. Rev.**, 2 (1988) 351.
16. D. Amantini, F. Fringnelii, O. Piermatti, F. Pizzo, E.Zunino, and L. Vaccaro; **J. Org. Chem.** 70 (2005) 6526-29.
17. F. A. Carry, R. J. Sundgerg, "**Advanced Organic Chemistry part:B Reaction and Synthesis**", fourth edition, Plenum Publisher, New York, 361(2001).
18. J. H. Boyer "**In Heterocyclic Compounds**", ed., R. C. Elderfield Wiely New York, Vol.7, p.384 (1961).
19. A. R. Katritzky and A. F. Pozharskii "**HandBook of Heterocyclic Chemistry**", 2nd ed. Pergamon, Amesterdam, 361-63(2000).
20. H. C. Kolb, C. Cavallaro, Z. C. Shi, A. Gontcharov, Z. M. Wang, P. F. Richardson, and R. C. Kanamarlapud; **U.S. Patent, 0135050A1 (2002)**.
21. H- S. Dong, K. Wei, Q- L. Wang, B. Quan and Z-Y. Zhang, **J. Chin. Chem. Soc.**, 47 (2000) 343-6.
22. H-S. Dong and S-Q. Lin, **J. Chin. Chem. Soc.**, 50 (2003) 1215-19.
23. H-S. Dong, W. Jia, J-D. Cui and Q-L. Wang, **J. Chin. Chem. Soc.**, 50 (2003) 1209-13.
24. H-S. Dong and B. Wang, **J. Chin. Chem. Soc.**, 52 (2005) 103-8.
25. E. M. Kamel, R. A. Ahmed and O. S. Moustafa, **J. Chin. Chem. Soc.**, 52 (2005) 149-53.

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