Green Synthesis of biocompatible Heterocyclic compounds

Heterocyclic compounds play a very important role in chemistry. because of their biological properties and their presence in the biological molecules such as DNA and RNA. Wide range of heterocyclic compounds are used to treat various diseases and hence they have an application in pharmaceutical industries. The huge demand of such compounds cannot be fulfilled from natural sources and hence they are synthesized chemically using various chemical methods. These chemical methods produce excessive amount of toxic waste and harmful by-products .Subsequently Green synthesis is introduced to avoid usage of toxic chemicals, costly catalysts and drastic reaction conditions.. Green Synthesis of Heterocyclic compounds result in higher yield of the product , increased purity, less reaction time, mild reaction condition and reduced level of side products .

Among all heterocyclic compounds ,the pyrimidine nucleus has gained immense importance in human life due to their variety of applicationsof its derivatives in agriculture., medicine, pharmacology and industry. It has been found that substituted pyrimidine derivatives possess diverse biological properties such as anticancer, antiviral, antihypertensive, analgesic ,antipyretic ,anti-inflammatory , antitumor , antiHIV etc,

Recent scientific reports show that the pyrimidine compounds are synthesized using green method. sodium lauryl sulfate (SDS) has been used as a green catalyst for the synthesis of Pyrido[2,3-*d*]pyrimidine Derivativesby SHENG-HUI LI et al (2010) in aqueous media [1], Pyrimido[4,5_d]pyrimidine derivatives were synthesized by A.H. Kategaonkar et al (2009) using an efficient and facile solid support of alumina which was used as an energy transfer medium[2],Pyrazolo[3,4-*d*]pyrimidine,Pyrazolo[4,3-*e*][1,2,4]triazolo[1,5-*c*]pyrimidine, Pyrazolo[4,3-*e*][1,2,4]triazolo[1,5- *c*]pyrimidine, Pyrazolo[3,4-*d*]pyrimidin-4-one derivatives have been synthesized by Ali Gharib et al (2009) using heterogeneous preyssler heteropolyacid[3], 2,6–diamino-6-phenylpyrimidine-5-carbonitrile was synthesized by M.B.Deshmukh (2008) using potassiumcarbonate [4], novel pyrazolo [1, 5-a] pyrimidine derivatives have been synthesized by Baseer M. Shaikh et al (2011) using PEG-400 [5].

Fused Pyrazolo[1,5-*a*]pyrimidines were prepared by Jairo Quiroga et al (2008) under Solvent free condition [6]. Pyrimido[4,5-*d*]pyrimidine Derivatives have bee prepared by Mazaahir Kidwai et al (2006)aqueousmedia using water as as a green solvent [7].s Pyrimido[4,5-d]pyrimidine- 2,4,7-trione and pyrido[2,3-d:6,5-d] dipyrimidine-2,4,6,8-tetrone derivatives were synthesized by Minoo Dabiriet al(2006) under microwave irradiation [8].

Green pyrimidine synthesis involving the use of microwave assisted method in presence of TEBA for the synthesis of Novel methyl-6-(sub-phenyl)-4-(sub-phenyl)-2-oxo-3,4-dihydro-1-H-pyrimidine-5-ketone by A.S.Sonar et (2011)[9] , Fused Pyrimidines were prepared by H. M. Meshram et al (2012)using boric acid in aqueous media [10], Pyrimido[4,5-*d*]pyrimidines have been synthesized by Mounir Abbas et al (2012)using ceric ammonium nitrate through Biginelli Reaction [11] , 2-(1-Pyrrolidinyl)-4, 6-Diarylpyrimidines were synthesized by Anju Devpura et al (2011) using inorganic solid support under Microwave irradiation[12].

The ecofriendly catalyst L Tyrosine has also been used as a catalyst for the synthesis of 5-Arylidene-pyrimidine-2,4, 6-triones and 5-Arylidene-2-thioxo-dihydro-pyrimidine-4, 6-diones by G. Thirupathi et al (2013) in aqueous media[13].The nanaocatalyst of sulphonic acid nanoporous silica has also been used in the green synthesis of pyrano[2,3-d]-pyrimidine dione derivatives by Ghodsi Mohammadi Ziarani et al (2013)[14].

The present investigation is proposed to design novel green methods to synthesis pyrimidine derivatives using nano catalysts and their biological activities will be studied using insilico methods.

REFERENCES

[1] SHENG-HUI LI, YAN-HONG SHEN, NA GAO and JI-TAI LI, *E-Journal of Chemistry* , 7 (2010)70 79-784

[2] A.H. Kategaonkar, S.A. Sadaphal, K.F. Shelke, B.B. Shingate, M.S. Shingare *Ukrainica Bioorganica Acta 1 (2009) 3—7*

[3] Ali Gharib, Manouchehr Jahangir1, Mina Roshani, *ECSOC 13* 1-30 (2009).

[4] M.B.Deshmukh,R.Patil, *Indian Journal of chemistry* 47B(2008) 792-795

[5] Baseer M. Shaikh2, Shankaraiah G. Konda2, Santosh S. Chobe *J. Chem. Pharm. Res.*, 3(2)(2011)435-443

[6] Jairo Quiroga, Jaime Portilla, Silvia Cruzc, Rodrigo Abonía *The Open Organic Chemistry Journal*, , 2(2008) 92-99

[7] Mazaahir Kidwai, Kavita Singhal, and Shuchi Kukreja , *Verlag der Zeitschrift f¨ur Naturforschung* 62b (2006)732 – 736

[8] Minoo Dabiri, Hamid Arvin-Nezhad, Hamid Reza Khavasi and Ayoob Bazgir Tetrahedron 63 (2007) 1770–1774

[9] A.S. SONAR and P.R. SOLANKI, *An International Journal of Advances In Pharmaceutical Science s*2 (2011) 5 – 6

[10] H. M. Meshram, A. Sanjeeva Kumar, G. Santosh Kumar, A. Swetha, B Chennakesava Reddy and P. Ramesh, *Der Pharma Chemica*, 4(3) 2012, 956-960

[11] A.M.M. El-Saghier et al *Chemistry Journal* 02, (2012),. 64-68

[12] Anju Devpura,sheetal Shakawat ,Smmer S Chudawat,Jayant P sing ,Parual Tiwari and Shiv Singh Dulawat ,*Asian Journal of Biochemical and Pharmaceutical Research 1 (20111) 1*

[13] G. THIRUPATHI, M. VENKATANARAYANA ,*Chem Sci Trans*, 2(2), 2013441-446

[14] Ghodsi Mohammadi Ziarani1, Sakineh Faramarz, Shima Asadi, Alireza Badiei, Roya Bazl and Massoud Amanlou, *DARU Journal of Pharmaceutical Sciences*,3(2013) 21