

REFERENCES

- (1) Saravanan .; *Arch. Pharm. Chem. Lifesci.***338**,488(2005).
 - (2) Erlenmeyer, E.; and Kunlin, *J. Ann.* **316**, 145 (1901).
 - (3) Erlenmeyer, E.; and Frustuck, E.; *Ann.* **284**, 36 (1895).
 - (4) Erlenmeyer, E.; *Ann.* **307**, 70 (1899).
 - (5) Kandile, Nadia G.; Abdel Latif, Tahia, M.; El-Sayed, Wafaa ,A.;
Rev. Roum. Chim . **36** , 245, (1991) (Eng).
 - (6) El-Hashash, M. A.; Hassan, Madkour, M.F and Amine, M.s.;
Pak. J. Sci, Ind. Res. **34**, 288 (1991).
 - (7) Fahmy, A..F.M.; Abd El-Maksoud and Shennoda, M.G.; *Pak. J. Sci, Res.* **20 (3)**, 150 (1977).
 - (8) Fahmy, A.F.M.; Afifi, A. A.; and Shennoda.; *Rev. Rom. Dechim.* **24** , 373 (1979).
 - (9) Jadhav, V.B.; *European Journal of Medicinal chemistry* **XX** (2007).
 - (10) Kidwai, M.; Mothsra ,P.; *Tetrahedron lett* .**47**,5029 (2006) .
 - (11) Siddiqui, S.A..; *Tetrahedron lett.* **61**,3539 (2005) .
 - (12) Plummer, C.W.; Finke, P.E.; Mills, S.G.; wang, J.; Tong, x.;
Doss, G.A.; Fong, T.M.; Lao, J.Z.; Schaeffer, M.T.; chen, J.;
shen, C.-p.; sribling, D.S.; Shearman, L.p.; strack, A.M.;
vander ploeg. L.H.T. *Bioorg. Med. Chem.* **15**,1441 (2005).
 - (13) Heravi, M.M.; *Journal of Molecular catalysis A ; Chemical.* **263**,112 (2007) .
-

- (14) Xia, M.; Lu, Y. d.; *Journal of Molecular catalysis A; chemical*. **265**,205 (2007).
- (15) Heravi, M.M.; *Journal of Molecular catalysis A; chemical* .**263** ,279(2007).
- (16) Wang, L.-M.; *Journal of Fluorine chemistry* .**127**,1570 (2006).
- (17) RIO, P.G.; Ran Jon, A.; *Bull. Soc. Chim. Fr.***543** (1958).
- (18) Balalaie, S.; *Tetrahedron lett.* **44**,1709 (2003).
- (19) Stoeck, U.; Schunak, V.; *Arch. Pharm.* **309**,421 (1976).
- (20) Balalaie, S.; Arabanian, A.; *Green chem.* **2**,274(2002).
- (21) Xu ,Y.;Liu,Y-Z.; Rui, Li, Guo, Q-x.; *Heterocycles* .**63**,87 (2004).
- (22) Lee, S.-H.; YOSIHIDA , k.; MATSUSHITA , H.; CLAPHAM, B.; KOCH, G.; ZIMMERMANN, J.; JANDA*, K.; *J.Org. chem.***69**,**25**,8829(2004);*Dep.Chem.,ScrippsRes.Inst .San Diego, La Jolla, CA 92037, USA: Eng.- Jannicke*.
- (23) Bull , Korean.; *Chem. Soc.* **28**,6 (2007).
- (24) (a) Lee, B.H.; Lee, J.Y.; Chung , B.Y.; Lee, Y.S.; *Heterocycles*. **63**,95(2004);(b) Lee, Y.S.; lee, B.H.; Park, S.J.; Kang, S.B.; Rhim, H.; Park, J.-Y.; Lee, J.H.; Jeong, S.-w.; Lee, J.Y.; *Bioorg. Med. Chem. Lett.***14**,3379 (2004);(c) Rhim, H.; Lee, Y.S.; Park, S. J.; Chung, B.Y.; Lee, J.Y.; *Bioorg. Med. Chem. Lett.* **15**,283(2005);(d) Park, S.J.; Park, S.J.; Lee, M.J.; Rhim, H.; Kim,Y.; Lee, J.-H.; Chung, B.Y.; Lee, J.Y.; *Bioorg. Med. Chem.***14**,3502(2006).
-

- (25) Marwaha, A.; *Tetrahedron lett.* **45**, 8945(2004) .
- (26) Katritzky, A.R.; Zhu, L.; Lang, H.; Denisko, O.; wang, Z.; *tetrahedron lett.* **51**,13271(1995).
- (27) Ostresh, J.M.; Schoner, C.C.; Hamashin,V.T.;Nefzi A.; Meyer, J.-P.; Houghten, R. A.; *J. Org. Chem.***63**,8622(1998).
- (28) Acharya, A.N.; Ostresh, J.M.; Houghten, R.A.; *J. Comb. Chem.* (2002).
- (29) **(a)** Fodor ,G.; Nagubandi, S.; *Tetrahedron.* **36**,1279 (1980); **(b)** Bohle, E.; Egg, H.; Gollner, B.; Jussel, C.; *Sci.Pharm.***57**,333 (1989); **(c)** Gauthier, J.A.; Jirkovsky, I.; *Us patent No. 4*, 379, (1983).
- (30) **(a)** Acharya, A.N.; Ostresh, J.M.; Houghten, R.A.; *J.Org. Chem.* **66**,8673(2001); **(b)** Acharya , A.N.; Ostresh, J.M.; Houghten. R.A.; *J. Comb. Chem.* **3**,612(2001).
- (31) Acharya, A.N.; Ostresh, J.M.; Houghten, R.A.; *Tetrahedron.* **58**,221(2002).
- (32) Acharya, A.N.; *Tetrahedron.* **58**,2095 (2002).
- (33) Desai ,M.C.; Stramiello ,L.M.; *Tetrahedron lett.* **48**, 7685 (1993) .
- (34) Gillman, K.W.; *Bioorg. Med. Chem.* **14**,5517 (2006).
- (35) Lee, S.-H.; Yoshida, K.; Matsushita, H.; Clapham, B.; Koch, G.; Zimmermann, J.; Janda ,K.D.; *J. Org. Chem.* **69**, 8829 (2004).
- (36) Lawson, A.; *J. Chem. Soc.***307**(1956).
-

- (37) Marwaha, A.; Singh, P.; MahaJan, M.P.; Velumurugan, D.; *Tetrahedron lett.* **45**,8945(2004).
- (38) Popilin, O.N.; Tischenko, V.G.; *Khim. Geterots. Soedin.* 1264 (1972).
- (39) Claiborne, C.F.; Liverton. N.J.; Nguyen, K.T.; *Tetrahedron lett.* **39**,8939(1998).
- (40) (a) Heinze, J.; Baumgartel, H.; Zimmermann, H.; *Chem. Ber.* **101**,3504(1968).; (b) for a more recent procedure for preparation of α -amidoketones, see: Murry, A.A.; Frantz, D. E.; Soheili, A.; Tillyer, R.; Grabowski, E.J.J.; Reider, P.J.; *J. Am. Chem. Soc.* **123**,9696(2001).
- (41) Partidge, M.W.; and Turner, H.A.; *J. Chem. Soc.* **2086** (1958).
- (42) Grenda, V.J.; Jones, R.E.; Gal, G.; and Sletzinger, M.; *J.Org. Chem.* **30**, 259 (1965).
- (43) Ferreira, S.B.; *European Journal of Medicinal chemistry* **XX** (2007).
- (44) Kan, H.C.; *Tetrahedron.* **63** ,1644(2007).
- (45) Bures, F.; Kulhanek, J.; *Tetrahedron Asymmetry.* **16**, 1347 (2005).
- (46) Bures, F.; *Tetrahedron Asymmetry* .**17** ,900(2006).
- (47) Citerio, L., Pocar, D.; Stradi, R.; *J. chem. Soc., perkin Trans. I.* 309(1978).
- (48) Stradi, R.; Verga, G.; *Synthesis.* **688**(1977).
- (49) Citerio, L.; Stradi, R .; *Tetrahedron lett.* **18**,4227(1977).
-

- (50) Kawase, M.; *J. Chem. Soc., chem. Commun.* **2101**(1994).
- (51) For the chemistry of α -Haloketones and their utility in heterocyclic synthesis, see: Erian, A.W.; Sherif, S.M.; Gaber, H.M.; *Molecules*. **8**,793(2003).
- (52) Khamnna, I.K.; Weier, R.M.; Yu, Y.; Xu, X.D.; Koszyk, F.J.; Collins, P.W.; Koboldt, C.M.; veenhuizen, A.W.; Perkins, W. E.; Casler, J.J.; Masferrer, J.L.; Zhang, Y.Y.; Gregory, S.A.; Seibert, K.; Isakson, P.C.; *J. Med. Chem.* **40**,1634(1997).
- (53) Khanna, I.K.; Yu, Y.; Huff, R.M.; Weier, R.M.; Xu, X.; Koszyk, F.J.; Collins, P.W.; Cogburn, J.N.; Isakson, P.C.; Koboldt, C.M.; Masferrer, J.L.; Perkins, W.E.; Seibert, K.; Veenhvizen, A.W.; Yuan, J.; Yang, D.-C.; Zhang, Y.Y.; *J. Med. Chem.* **43**,3168(2000).
- (54) Asproni, B.; Pau, A.; Bitti, M.; Melosu, M.; Cerri, R.; Dazzi, L.; Seu, E.; Maciocco, E.; Sanna, E.; Busonero, F.; Talani, G.; Pusceddu, L.; Altomore, C.; Trapani, G.; Biggio, G.; *J. Med. Chem.* **45**,4655(2002).
- (55) Asproni, B.; Talani, G.; Busonero, F.; Pau A.; Sanna, S.; Cerri, R.; Mascia, M.P.; Sanna, E.; Biggio, G.; *J. Med. Chem.* **48**,2636(2005).
- (56) **(a)** Mano, T.; Stevens, R.W.; Ando, K.; Nakao, K.; Okumura, Y.; Sakakibara, M.; Okumura, T.; Tamura, T.; Miyamoto, K.; *Bioorg. Med. Chem.* **11**,3879(2003); **(b)** Mano, T.; Okumura, Y.; Sakakibara, M.; Okumura, T.; Tamura, T.; Miyamoto, K.; Stevens, R.W.; *J. Med. Chem.* **47**,720(2004).
- (57) Shilcrat, S.C.; Mokhallati, M.K.; For Tunak, J.M.D.; Pridgen, L.N.; *J. Org. chem.* **62**,8449(1997).
-

- (58) Jaydcakumar, S.; Ishar, M.P.S.; Mahajan, M.P; *Tetrahedron lett.* **39**,6557(1998).
- (59) Fischer, Veiel.;Ber. **38**, 320 (1905).
- (60) Bistrzychi, Prezeworski.; Ber. **45**, 3483 (1913).
- (61) Phillips.; *J.Chem. Soc.*2393(1928).
- (62) Huges, Linos.; *J. Proc. Roy. Soc.* **71**, 209 (1938).
- (63) Francesco Risitano, Giovanni Grassi, Francesco Foti.;*J.Heterocyclic Chem.* **38**, 1083 (2001).
- (64) Ramaiahk, Grossert, J.S.; Hooper, D.L.; Dubey, P.K.; *Ramana-tham J. Indian Chem. Soc.* **76**, 140 (1999).
- (65) Hein, D.W.; Alheim R.J.; Leavitt.; *J. Amer. Chem. Soc.* **79**, 427 (1957).
- (66) Gayathn, V.; Shashikala, N.; Nanje, M.; Reddy, H.; *J.Chem. Soc.* **32 A (1)**, 33 (1990) (Eng).
- (67) Copland, Day; *J. Amer.Chem. Soc.* **65**, 1072 (1943).
- (68) Benedikta Puodziunatie, Lidija Kosychova, Zita Strumbreviciute, zita Talaikyte ; *J.Heterocyclic Chem* . **36**, 1013 (1999).
- (69) Vinot N.; *Bull. Soc. Chem.* 522 (1993).
- (70) Cramp, Micheal Colin, Pearson, Christopher Jone.; Eur.Pat. Ep. 509, 717 (Cl, C07 D401/ 04), 21Oct. 1992, 1991; 31 pp.
- (71) Nagashima, H.; *Polyhedron.* **22** ,1823(2003).
- (72) Mcelvain,S.M.; Clarke, R.L.; *J. Am.Chem.soc.***69**, 2661 (1947).
- (73) Lamchen, M.T.; Mittag, W.; *J. chem. Soc. C*,2300(1966).
-

- (74) Starcevic, K.; *Bioorg. Med. Chem.* **15**,4419(2007) .
- (75) Starcevic, K; Boykin,D.W.; karminski.-Zamola, G.;*Heterocycl, Commum.* **8**,222(2002).
- (76) Weidenhagen.; *Ber.* **69**, 2263 (1936).
- (77) Proc, Estonian Acad. Sci. *chem.* **50**,3,180(2001).
- (78) Uspat 5430043, July, 4, (1995).
- (79) Katritzky, A.R.; Meth-cohn,O.;&.Rees,C.W.:(Eds); Comprehe-nsive organic functional group transformations, *pergamon,Uk.* **6**(1995).
- (80) Coad, E.C.; *Tetrahedron.* **55**,2811 (1999) .
- (81) David ,W.; wood ward, us patent # **19**,332 (1950).
- (82) Kadyrov, Ch.Sh.; Kholmatov, P., U.S.S.R.Su 1,164 (ClC0723 5/30), 30 Jun. (1985). *Appl.* **3** ,743,(1983) from *Otkrytica*.
- (83) Rao, Ramana, G.; Srinivasa, K.; *Indian J.Pharm.Sci.* **51**, 192(1989).
- (84) Snahnaz rostamizadeh, Eamaicl Derfshian, *J.Chem Research (s)*, 227(2001).
- (85) Pawar, V.G.; *Tetrahedron lett.***47**,5451 (2006).
- (86) Reports which describe the use of vilsmeier reagents in the synthesis of imidazole **(a)** Acharya, A.N.; Thai, C.; Ostresh, J. M.;Houghten, R.A.; *J.comb.Chem.***4**,496(2002); **(b)** Srinivas, K.; Nair, C.K.S.; Ramesh, S.; Pardhasaradhi, M.; *Synthesis.* **4**,504(2004).
- (87) De La Hoz, A.; *Tetrahedron* **62** ,5868(2006).
-

- (88) **(a)** Chen, D.; Timmons, C.; Wei, H.-X.; Li, G.; *J.Org.Chem.* **68**,5742(2003); **(b)** Landor, S.R.; Landor, P.D.; Fomum, Z.T.; Mbafor, J.T.; Nkengfack, A.E.; *J. Chem, Soc.; Perkin Trans./* 1223(1983); **(c)** Landor, S.R.; Landor, P.D.; Fomum, Z.T.; Mpango, G.W.B.; *J. Chem. Soc. Perkin trans./* 2289 (1979); **(d)** Fomum, Z.T.; Zacharias, T.; Landor, P.D.; Landor, S.R.; *J. Chem. Soc., Chem. Commun.* 706(1974).
- (89) Michelin, R.; Mozzon, M.; Bertani, R.; Benetollo, E.; Bombreri, G.; Angelicci, R. ; *J. Inorg. Chin. Acta.* **222** ,327 (1994).
- (90) **(a)** Sawa, N.; *Nippon Kagaka Zasshi.* **89**,780(1968); **(b)** Mohammed Poor-Baltork, I.; Abdollahi-Alibeik, A.; *Bull. Korean Chem. Soc.* **24**,1354(2003).
- (91) Dockner, T.; Frank, A.; *Ger. Offen. CODEN, GWXXBXDE.* **323**, 6598(1984).
- (92) Dockner, T.; Kempe, U.; Krug, H.; Magnussen, P.; Praeorius, W.; Hans, J.; *Ger. Offen. CODEN; GWXXBXDE* 28544 ,**28**, (1980).
- (93) Abbotto, A.; Bradamante, S.; Pagani, G.A.; *J.Org.Chem.* **61**, 1761(1996).
- (94) **(a)** Meyers, A.I.; Knave, G.; Kamata, K.; Ford, M.L.; *Am. Chem.Soc.* **98**,567(1976); **(b)** Roth, H.G.; Kanamarlapudi, R.C.; Richardson, P.F.; Khame, G. *U.S. patent 0153728. A1*(2003).
- (95) Frutos, R.P.; *Tetrahedron lett.* **46** ,8369(2005).
- (96) Grella, G.E.; *European Journal of pharmaceutical sciences* .**20**, 267(2003) .
-

- (97) Nunami, K.-I.; Yamada, M.; Tukvi, T.; Matsumoto, K.; *J.Org. Chem.* **59**,7635(1994).
- (98) Marck wald, W.; *Chem. Ber.* **25**,2354(1892).
- (99) Xi, N.; *Tetrahedron lett.* **46** ,7315(2005).
- (100) **(a)** Herrmann, W.A.; Goossen, L.J.; Kcher, C.; Artus, G.R.; *Angew. Chem. Int. Ed. Engl.* **35** ,2805(1996); **(b)** Bao, W.L.; Wang , Z.M.; Li, Y.X.; *J.Org.Chem.* **68**,291 (2003); **(c)** Jiang, H.-Y.; *Journal of Molecular catalysis A:Chemical* . **260**, 288(2006).
- (101) Jean- Pierr.; *Green chemistry.* **3**,165(2001).
- (102) Engel, N.; Steglich, W.; *Liebigs Ann. Chem.*1916(1978).
- (103) Bleicher, K.H.; *Tetrahedron lett.* **43** ,7687(2002).
- (104) Bleicher, K.H.; Gerber,F.; Wüthrich,Y.; Alanine,A.; Caprelta, A.; *Tetrahedron lett.* **43**,8110(2002).
- (105) Lantos, I.; Zhang, W.-Y.; Shui, X.; Eggleston, D.S. ;*J.Org. Chem.***58**,7092(1993).
- (106) Gallagher,T.F.; Seibel, G.L.; Kassis, S.; Laydon, J.T.; Blumen-thal, M.J.; Lee, J.C.; Lee, D.; Boehm, J.C.; Fierthompson, S.M.; Abt, J.W.; Soreson, M.E.; Smietana, J.M.; Hall, R.F.; Gari-gipati, R.S.; Bender, P.E.; Erhard, K.F.; Krog, A.J.; Hofmann, G.A.; Sheldrake, P.L.; McDonnell, P.C.; Kumar ,S.; Young, P.R.; Adams, J.L.; *Bioorg. Med. Chem.* **5** ,49 (1997).
- (107) Gardiner, J.M.; Procter, J. ; *Tetrahedron lett* **42**,5109(2001).
- (108) Gardiner, J.M.; *Tetrahedron lett* . **43**,7707 (2002).
-

- (109) Samanta, S.K.; *Bioorg. Med.Chem Lett.* **15**,3717 (2005).
- (110) Cheng , J.-F.; *Tetrahedron Lett.* **43**,4571 (2002).
- (111) **(a)**Magnus, P.; Gallagher, T.; Brown, P.; Pappalardo, P.; *Acc, Chem.Res.***17**,35(1984);**(b)**Lee,S.S.;Kim,C.S.;Park,H.;*Heterocycles* .**38**,2605(1994).
- (112) **(a)**Wendeborn, S.D.; Mesmaeker, A.; Brill, W.K.-D.;*Synlett.* **865**,(1998); **(b)**Vojkovsky,T.; Weichsed,A.; Patek,M.; *J.Org. Chem.* **63**,3162(1998).
- (113) Chamoin, S.; Houldsworth, S.; Kruse, C.G.; Bakker, W.I.; Snieckus, V.; *Tetrahedron Lett.***39**,4179(1998).
- (114) Zuckermann, R.N.; Kerr, J.M.; Kent, S.B.H.; Moos, W.H.J.; *Am Chem. Soc.* **114**,10646(1992).
- (115) Kim, Y.B.; Kim, C.S.; Lee, C.K.; *J.Heterocyclic chem.* **31**, 1653 (1994).
- (116) Plummer, C.W.; *Bioorg. Med. Chem. Lett.* **15**,1354 (2005).
- (117) Rovsselet, G.; Capdevielle, P.; Mavmy, M.; *Tetrahedron lett.* **34**,6395(1993).
- (118) Frutos, R.P.; *Tetrahedron lett.* **46**,8369 (2005).
- (119) Tafeenko, V.A.; Paseshnichenko, K.A.; Ershov, O.V.; Eremkin, A.V.; Aslanov, L.A.; *Acta Crystallogar.* **C61**, 0434 (2005).
- (120) **(a)** Mckusick, B.C.; Heckert, R.E.; Cairns, T.L.; Conffman, D.D.;Mower,H.F.;*J.Am.Chem.Soc.***80**,2806(1958);**(b)**Middlet-on , W.J.; Little, E.L.; Conffman, D.D.; Engelhardt, V.A.; *J. Am. Chem. Soc.***80**,2795(1958).
- (121) Eremkin, A .V.; *Tetrahedron lett* .**47**,1445 (2006).
-

- (122) BHAT, B.A.; DHAR*, K.L.; PurI, S.C.; Spiteller, M.; *Synlett* **17**,1723(2006);*Reg.Res.Lab.;synth.Chem.seet.;Jammu180001*, India.; Eng.) Mais.
- (123) Theoclitou, M.-E.; Delaet, N.G.; Robinson, L.A.; *J.Comb. Chem.* **4**,315(2002).
- (124) Lange, U.E.W.; *Tetrahedron lett.* **43** ,6857(2002).
- (125) Ding, M.-W.; Tu, H.-Y.; Liu, Z.-J.; *Synth.Comm.* **27**, 3657 (1997).
- (126) Visser,W.; Jung, G.; New solid phase synthesis of 2-aminoimidazolone poster P-48 presented at international combinatorial chemistry symposium in tubingen, Germany . **3**, 6(1999).
- (127) Drewy, D.-H.; Ghiron, C.; *Tetrahedron Lett.* **41**,6989(2000).
- (128) Houssin, R.; Bernier, J.L.; Henichart, J.P.;*synthesis.* **259**, 261 (1988).
- (129) Yamamoto, N.; Isobe, M.; *Chem. Lett.* 2299(1994).
- (130) Barvian,M.R.; Showalter,H.D.H.; Doherty,A.M.; *Tetrahedron Lett.* **38**,6799(1997).
- (131) Claremon, D.A.; Phillips, B.T.; *Tetrahedron Lett.* **29**, 2155 (1988).
- (132) Baldwin, J. E.; Williams, R.M.; *Eds; Pergamon; oxford.* **17** , 96 (1998).
- (133) Bannwarth, W.; Felder, E.; *Ed.Wiley-VCH.Weinheim.***9**, 99 (2000).
- (134) Vanleusen, D.; VanLeusen, A.M.; *Org.React.* **57**, 417 (2001).
-

- (135) Vanleusen, A.M.; Wildeman, J.; Oldenziel, O.H.; *J. Org. Chem.* **42**, 1153 (1977).
- (136) Possel, O.; Vanleusen, A.M.; *Heterocycles* **7**, 77 (1977).
- (137) For reviews on the synthetic implications of TOsMIC, see:
(a) Tandon, V.; Rai, S.; *Sulfur Rep.* **24**, 307 (2003); (b) Lambert, C.; *J. Prakt. Chem.* **340**, 483 (1998).
- (138) Shih, M.H.; *Tetrahedron Lett.* **63**, 2990 (2007).
- (139) Ireland, S.M.; *Tetrahedron Lett.* **44**, 4369 (2003).
- (140) Hunter and Marriot, *J. Chem. Soc.* **777** (1941).
- (141) Lorenzelli, V.; and Randi, G.; *Atti Acad. Nazl. Lincei, Rend. Classe Sci. Fis. Mat Nat.* **36**, 646 (1964). *Chem. Abs.* **62**, 7612 (1965).
- (142) Kolodyazhnaya, S.N.; Divaeva, L.A.; Simonov, A.M.; Kukushkin, S.A.; *Khim. Geterotsikl. Soedin.* **10**, 1425 (1988).
- (143) Kochergin, P.M.; Paley, R.M.; Chernyak, S.A.; *Khim. Geterotsikl-Soedin.* **5**, 656 (1993).
- (144) Kochergin, P.M.; Paley, R.M.; Chernyak, S.A.; *Khim. Geterotsikl. Soedin.* **5**, 659 (1993).
- (145) Htay, M.M.; Meth-Cohn, O.; *Tetrahedron Lett.* **79** (1976).
- (146) Liverton, N.J.; Butcher, J.W.; Claiborne, C.F.; Claremon, D.A.; Libby, B.E.; Nguyen, K.T.; Pitzenberger, S.M.; Selnick, H.G.; Smith, G.R.; Tebben, A.; Vacca, J.P.; Varga, S.L.; Agarwal, L.; Dancheck, K.; Forsyth, A.J.; Fletcher, D.S.; Frantz, B.; Hanlon, W.A.; Harper, C.F.; Hofsess, S.J.; Kostura, M.; Lin,
-

- J.; Luell, S.; O' Nell, E.A.; Orevillo, C.J.; Pang, M.; Parsons, J.; Rolando, A.; Sanyl, Y.Y.; Visco, D.M.; O' Keefe, S.J.; *J. Med. Chem.* **42**,2180(1999).
- (147) Walker, K.A.M.; *Us patent* **4, 059**, 705 (1997).
- (148) Diez-Barra, E.; Dela Hoz, A.; Loupy, A.; Sanchez-Migallon, A.; *Heterocycles*. **38** ,1367(1994) .
- (149) Perozo-Rondon, E.; *Applied surface science*.**252**,6067 (2006).
- (150) Lopez-Pestana,J.M.; *Microporous and Mesoporous Materials*. **67** ,87 (2004) .
- (151) Khabnadideh, S.; *Bioorg. Med. Chem. Lett.* **13**,2863 (2003).
- (152) Sitkina, L.M and Simonov, A.M.; *Khim. Geterotsikl. Soedin.* **143** (1966).
- (153) Klapars, A.; Antilla, J.C.; Huang, X.; Buchwald, S.L. ; *J.Am. Chem. Soc.***123**,7727(2001).
- (154) Kiyomori, A.; Marcoux, J.F.; Buchwald. S.L.; *Tetrahedron lett.* **40**,2657(1999).
- (155) Wolfe, J.P.; Wagaw, S.; Buchwald, S.L.; *J.Am.Chem.Soc.* **118**,7215(1996).
- (156) Yue, W.; *Bioorg. Med. Chem. Lett.* **14**,1637 (2004).
- (157) Cass, J.C.; Katritzky, A.R.; Harlow, R.L.; Simonsen, S.H.; *J. Chem. Soc. Commun*, **48** (1976).
- (158) Pozharskii, A.F.; Garnovskii, A.D.;Simonov, A.M.; *Russ. Chem. Rev (Eng. Transl.)* **35**, 122 (1966).
- (159) Ohta, A.; Watanabe, T.; Nishiyama, J.Uehara, K.; Hirate, R.; *Heterocycles*. **14**, 1963 (1980).
-

- (160) Grimmett, M.R.; Katritzky, A.R.; Rees, C.W.; Scriven, E.F.V.; Eds.; *Comprehensive Heterocyclic chemistry II*; Pergamon; Oxford **3**,77(1996).
- (161) Grimmett, M.R.; *Sci. Synth.* **12**,325(2002).
- (162) **(a)** Iddon, B.; *Heterocycles*. **23**,417(1985); **(b)** Iddon, B.; Ngochindo, R.I.; *Heterocycles*. **38**,2487(1994).
- (163) Torregrosa, R.; *Tetrahedron*. **61**,11148(2005) .
- (164) Bellina, F.; Calandri, C.; Cauteruccio, S.; Rossi, R.; *Tetrahedron*. **63**,1970(2007).
- (165) **(a)** Bellina, F.; Catandri, C.; Cauteruccio, S.; Rossi, R.; 4th Eurasian Meeting on *Heterocyclic chemistry*, 27(2006); *thessaloniki, Greece, Book of Abstract P033*, pp.194-195; **(b)** Bellina, F.; Calandri, C.; Cauteruccio, S.; Difiore, A.; Rossi, R.; *XXII European Colloquium on Heterocyclic chemistry, Bari (Italy)*, 2(2006); *Book of abstracts S021*.
- (166) Bellina, F.; *Tetrahedron lett.* **63**, 4571(2007).
- (167) Sezen, B.; Sames, D. ; *J. Am. Chem. Soc.* **125**,10580(2003).
- (168) Bellina, F.; Cauteruccio, S.; Rossi, R.; *Eur. J.Org.Chem.* 1379(2006).
- (169) Revez, L.; Bonne, F.; Makavou, P.; *Tetrahedron lett.* **39**, 5171 (1998).
- (170) Zhong, Y.-L.; Lee, J.; Reamer, R.A.; Askin, D.; *Org.lett.* **6**, 929 (2004).
- (171) Bellina, F.; Difiore, A.; Cauteruccio, S.; Rossi, R.; (2006), unpublished results.
-

- (172) For previous examples of Suzuki- type reactions performed under phase transfer conditions, see: **(a)** Bellina, F.; Anselmi, C.; Martina, F.; Rossi, R.; *Eur. J. Org. Chem.* 2290(2003); **(b)** Zhang, J.; Blazecka, P.G.; Belmont, D.; Davidson, G. ; *J. Org. Lett.* **4**,4559(2002); **(c)** Bellina, F.; Falchi, E.; Rossi, R.; *Tetrahedron*. **59**,9091(2003).
- (173) Dobler, M.R.; *Tetrahedron lett.* **44**,7115(2003).
- (174) Pivsa-Art, S.; Satoh, T.; Kawamura, Y.; Miura, M.; Nomura, M.; *Bull. Chem. Soc. Jpn.* **71**,467(1998).
- (175) **(a)** Sezen, B.; Sames, D.; *J. Am. Chem. Soc.* **128**,8364(2006); **(b)** Kalyani, D.; Deprez, N.R.; Desai, L.V.; Sanford, M.S.; *J. Am.Chem.Soc.* **127**,7330(2005); **(c)** Oi, S.; Fukita, S.; Hirata, N.; Watanuki, N.; Miyano, S.; Inoue, Y.; *Org.Lett.* **3**,2579 (2004); **(d)** Shabashou, D.; Daugulis, O.; *Org.Lett.* **7**,3659(2005).
- (176) Ackermann, L.; Althammer, A.; Born, R.; *Angew. chem, Int. Ed.* **45**,2619(2006).
- (177) Novikov, S.S.; Khmel nitskii, L.I.; Lebedev ,O.V.; Seastyanova, V.V.; and Epishina, L.V.; *Chem. Heterocycl. Comp. (Eng. Transl.)* **9**, 465 (1973).
- (178) Chauviere, G.; Bouteille, B.; Enanga, B.; De Alu querqne, C.; Craft, S.L.; Dumas, M.; Perie, J.; *J.Med.Chem.* **46**,427 (2003).
- (179) Kashima, C.; Harada, Y.; Hosomi, A.; *Heterocycles*. **35**, 433 (1993).
- (180) Wang, D.; Hoseltine, *J. Heterocycl. Chem.* **31**,1637(1994).
- (181) Cerezo, V.; *Tetrahedron*. **63**,10445 (2007).
-

- (182) Kuzminykh, K.S.; Dumpis, M.A.; *Zh Obshch Khim.* **63**,1879 (1993) (*Russ*).
- (183) Kirk, K.L.; *J. Org. Chem.* **43**, 4381 (1978).
- (184) Bercin, Erdogan.; Ersan, Seyhan.; Atay, Okan.; Ueucu, Unint.; *J. Chem Soc., Perkin Trans. 2*, 5(1990).
- (185) Fadda,A.A.; Etman,H.A.; Ali,M.M.; *Pharmazie*.**46**,52 (1991).
- (186) Khallel,M.M.; Abd El-Fattah, B.;Khalifa,M.; *Egypt.J.Pharm. Sci.* **23** (1-4), 1(1982).
- (187) Popov,I.I.; Bogachev, Yu.G.; Tkachenko, P.V.; Simonov, A. M ; Tertov, B.A.; *Chem. Heterocycl. Compd. (Engl. Transl).* **1**, 487 (1976).
- (188) Fielden, R.; Meth-Cohn, O.; Suschitzky, H.; *J.Chem.Soc., Perkin Trans. 1*,705 (1973).
- (189) Krasovskii,A.N.;Kochergin,P.M.;Roman,A.B.;*KhimGeterotak ,Seodin*.**7**,822(1971).
- (190) Revesz,L.; Blum,E.; Dipadova, F.E.; Bihl,T.; Feifel,R.; Gram, H.; Hiestand,P.; Manning,V.; Rucklin,G.; *Bioorg.Med. Chem. Lett.* **14**,3595(2004).
- (191) Gainsford, G. J.; Woolhouse, A.D.; *J.Chem. Commun.***12**, 857 (1978).
- (192) Hadadin, M.J.; Hawi, A.A.; Nazer, M.Z.; *Tetrahedron Lett.* **4581**(1978).
- (193) Ogata, M.H.; Matsumoto, S.; Takahashi and H. Kano.; *Chem. Pharm. Bull.***18**, 964 (1970).
-

- (194) **(a)** Coskun, N.; Tat, F.T.; Güven, Ö.Ö.; Üikü, D.; Arici, C.; *Tetrahedron Lett.* **41**,5401(2000); **(b)** Coskun, N.; Tat, F.T.; Güven, Ö.Ö. ; *Tetrahedron*. **57**,3413(2001).
- (195) Blanchett, M.A.; Choy, W.; Davis,J.T.; Essinfeld, A.P.; Masa- mune, S.; Roush, W.R.; sakai, T.; *Tetrahedron lett.* **36**, 8251 (1995).
- (196) **(a)**Lovely, C.J.; Du, H.; Dias, H.V.R.; *Org. Lett.***3**,1319 (2001); **(b)**Deghati, P.Y.F.; Wanner, M.J.; Koomen, G.; *J.Tetrahedron lett.* **39**,4561(1998); **(c)** walters, M.A.; Lee, M.D.; *Tetrahedron lett.* **35**,8307(1994).
- (197) He,Y.; Chen,Y.; Wu,H.; Lovely,C.;*J.Org. lett.* **5**, 3623 (2003).
- (198) Kawasaki, I.; *Tetrahedron* .**62**,10182 (2006).
- (199) Lovely, C.J.; Du, H.; He, Y.; Dias, H.V.R.; *Org. Lett.***6**,735 (2004).
- (200) Asimilar type of rearrangement occurs on treatment of tetrahydrobenzimidazoles with singlet oxygen in the presence of base, see: **(a)** Bernhart, C.A.; Perreaut, P.M.; Ferrari,B.P.; Mune-aux, Y.A.; Assens, J.L.A.; Clement, J.; Haudricourt, F.; Mune-aux, C.F.; Taillades, J.E.; Vignal, M.-A.; Gougat, J.; Guiraudou, P.R.; Lacour, C.A.; Roccon, A.; Cazaubon, C.F.; Breliere, J.-C.; LeFur,G.; Nisato,N.; *J.Med.Chem.***36**,3371 (1993); **(b)**Kimura, M.;Lu, G.; Igo, H.; Tsunenaga, M.;Zhang, Z.; Hu, Z.; *Tetrahedron lett.* **48**,3109(2007).
- (201) The chen lab has reported a similar oxidative rearrangement of imidazolones using MCPBA, see: Tan, X.; *Chen.C.; Angew. Chem. Int. Ed.***45**,4345(2006).
-

- (202) Romo and Co-workers have reported a similar oxidative rearrangement of imidazolones with DMD₆, however these rearrange via an alternate pathway providing allylic alcohols, which on treatment with NCS rearrange to spiroimidzolones, see: **(a)** Dilley, A.S.; Romo, D.; *Org. Lett.* **3**, 1535 (2001); **(b)** Dransfield, P.J.; Wang, S.; Dilley, A.; Romo, D.; *Org. Lett.* **7**, 1679 (2005); **(c)** Dransfield, P.J.; Dilley, A.S.; Wang, S.; Romo, D.; *Tetrahedron* **62**, 5223 (2006); **(d)** wang, S.; Dilley, A.S.; Poullennec, K.G.; Romo, D.; *Tetrahedron*. **62**, 7155 (2006).
- (203) Sivapp, R.; *Bioorg. Med. Chem.* **14**, 7324 (2006).
- (204) Drew, H.D.K and Hatt, H.H.; *J. Chem. Soc.* **16** (1968).
- (205) Biguard, D and Grammaticakis, P.; *Bull. Soc. Chem. Frances*, 675 (1942).
- (206) Gadad, A.K.; Mahajanshetti, C.S.; Nimbalkar, S.; Raichurkar, A.; *Eur. J. Med. Chem.* **35**, 853 (2000).
- (207) Andotra, C.S.; Langer, T.C.; Kotha, A.; *J. Indian Chem. Soc.* **74**, 2 (1997).
- (208) Krezel, I.; *Farmaco.* **53**, 342 (1998).
- (209) Terzioglu, N.; Gursoy, A.; *Eur. J. Med. Chem.* **38**, 781 (2003).
- (210) Kolavi, G.; Hegde, V.; Khan, I.; Gadad, P.; *Bioorg. Med. Chem.* **14**, 3069 (2006).
- (211) Kazi, I.A.M.; Mahajanshetti, C.S.; Gadad, A.K.; Tarnalli, A.D.; Sultanpur, C.M.; *Arzneim-Forsch./ Drug. Res.* **46**, 949 (1996).
-

- (212) Andreani, A.; Leonia, A.; Locatelli, A.; Morigi, R.; Rambaldi, M.; Simon, W.A.; *J. Senn-Bilfinger, Arzneim-Forsch./ Drug. Res.* **50**,550 (2000).
- (213) Andreani, A.; Bonazzi, D.; Rambaldi, M.; Fabbri, G.; Rainford, K.D *Eur . J . Med .Chem.* **17**,271 (1982).
- (214) Andreani, A.; Rambaldi, M.; Mascellani, G.; Bossa, R.; Galatulas, I.; *Eur . J . Med . Chem* **21**,451 (1986).
- (215) Andreani, A.; Rambaldi, M.; Mascellani, G.; Rugarli, P.; *Eur. J. Med .Chem* **2219** (1987).
- (216) Andreani, A.; Rambaldi, M.; Locatelli, A.; Andreani, F.; *Collect . Czech. Chem . Commun .* **56**,2436 (1991).
- (217) Jackson, P.F.; Bullington, J.L.; *Curr.Top.Med.Chem.* **2**,1011 (2002).
- (218) Bolòs.; *J. Mini- Rev. Med. Chem.* **5**,857(2005).
- (219) Diller, D.J.; Lin, T.H.; Metzger, A.; *Curr. Top. Med. Chem.* **5**, 953(2005).
- (220) Leiferet, C.; Chidbouree, S.; Hampson, S.; Workman, S.; Sigee, D.; Epton, H.A.; Harbour, A.; *J. Appl. Bacteriol* **78**, 97 (1995).
-