Synthesis of some pyrazole and pyrimidine derivatives of sulfonamides

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1-Carboxymethylpyridinium-3-aminophenyl-5-methyl-4-(4'-substituted)sulfonamoylazopyrazoles (**2a-f**) and 2-amino-4-methyl-6-(4''-aminotoludyl)-5-(4'-sulfonamoyl)azopyrimidines (**3a-f**) were synthesized by condensation of 1-aminophenyl-2-(4'-substituted)sulfonamoylhydrazonobutane-1,3-dione (**1a-f**) with 1-carboxymethylpyridinium-hydrazine chloride (Girard-P) and guanidine nitrate respectively.

Chemistry of pyrazoles and pyrimidines has been extensively studied as many drugs include these rings. A number of pyrazole derivatives have been synthesized and found to possess biological activity¹. Pyrimidine is widely distributed in living cell and therefore play an important role in many biological processes². Many pyrimidine derivatives exhibit interesting medicinal and biological applications³⁻⁵. Sulfonamides are well known for their therapeutic value⁴. In light of these facts we have synthesized some new 1-carboxymethyl-pyridinium-3-aminophenyl-5-methyl-4'-substituted)sulfonamoylazopyrazoles (**2a-f**) and 2-amino-4-methyl-6-(4''-aminotoludyl)-5-(4'-sulfonamoyl)azopyrimidines (**3a-f**). These compounds were synthesized by diazotisation of sulfonamides.

Experimental

M. ps. were determined in open capillary tubes and are uncorrected. IR spectra were recorded on a Perkin-Elmer 883 spectrophotometer and ¹H NMR spectra (DMSO-*d*₆) on a Varian spectrophotometer using TMS as an internal standard. Compounds were routinely checked for their purity on silica gel G plates.

1-Aminophenyl-2-(4'-substituted)sulfonamoyl-hydrazonobutane-1,3-diones (1a-f): Sulfonamide (0.01 mol) was dissolved in mixture of conc. HCl (3 ml) and water (4 ml) and cooled to 0° in an ice bath. To this, cold solution of sodium nitrite (0.69 g, 0.01 mol) was added in small portions with constant stirring. The resulting compound (**1a**) was filtered and washed repeatedly with water and crystallized from ethanol, (65%), m.p. 253°; $\nu_{\max}$ 3240 (NH₂O₂S), 3100 (ArCH), 1630 (C=N), 1660 (C=O), 1140 (SO₂) and 750 cm⁻¹ (substituted phenyl); ¹H NMR (DMSO-*d*₆) δ 2.5 (3H, s, CH₃), 7.20–8.10 (9H, m, ArH) and 13.20 (enolic OH hydrogen bonded with C=O group). Similarly other compounds were prepared (yields 55–65%): **1b**, m.p. 210°;

c, 210°; **d**, 232°; **e**, 215; **f**, 242°.

The compound **1a-f** may be exist as :

A broad singlet at δ 13.20 ppm was observed which is characteristic of hydrogen bonded (chelated) enols. So much deshielding is only possible for chelated enols⁷. The light

yellow colours of **1a-f** is also indicating the azo functionality in conjugation with benzene ring. The colours of **1a-f** are also comparable with the colour of **2a-f** and **3a-f** which contain the azo (N=N) group.

1-Carboxymethylpyridinium-3-aminophenyl-5-methyl-4-(4'-sulfonamoyl)azopyrazoles (2a-j) : A solution of 1-aminophenyl-2-(4'-sulfonamoyl)hydrazonobutane-1,3-dione (**1a**; 0.001 mol) in acetic acid (10–15 ml) was mixed with Girad-P (0.001 mol) in acetic acid (15 ml) and the mixture was refluxed for 5 h, then allowed to cool overnight. The resulting solid (**2a**) was crystallized from ethanol, (65%), m.p. 189°; $\lambda_{\max}$ 360 nm; $\nu_{\max}$ 3250 (NH₂O₂S), 1140 (SO₂), 1510 and 1565 (C=N and N=N) and 1710 cm⁻¹ (C=O); δ 2.4 (3H, s, CH₃), 7.0–7.8 (H, m, substituted phenyl), 8.28 (2H, m, NH₂). Similarly other compounds were prepared (yields 50–65%) : **2b**, m.p. 200°; **c**, 205°; **d**, 200°; **e**, 175°; **f**, 178°.

2-Amino-4-methyl-6-(4''-aminotoluidyl)-5-(4'-sulfonamoyl)azopyrimidines (3a-f) : An alcoholic solution of 1-aminophenyl-2-(4'-sulfonamoyl)hydrazonobutane-1,3-dione (**1a**; 0.004 mol) was added to a solution of guanidine nitrate (0.004 mol) in a methanolic 10 N NaOH (10 ml). The mixture was refluxed for 5 h and then left overnight. Solid product thus separated out was washed with metha-

nol and hot water. The resulting solid (**3a**) was crystallized from DMF-ethanol mixture, (65 %), m.p. 200°; $\lambda_{\max}$ 346.0 nm; $\nu_{\max}$ 3320 (NH₂), 1610 (N=N), 1160 (C=N or C=C), 1135 (SO₂), 750 cm⁻¹ (substituted phenyl); δ 2.48 (6H, s, CH₃), 3.88 (2H, s, NH₂) and 7.2–7.9 (4H, m, substituted phenyl). Similarly other compounds were prepared (yields 55–65%) : **3b**, m.p. 242°; **c**, 225°; **d**, 187°; **e**, 185°; **f**, 215°.

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