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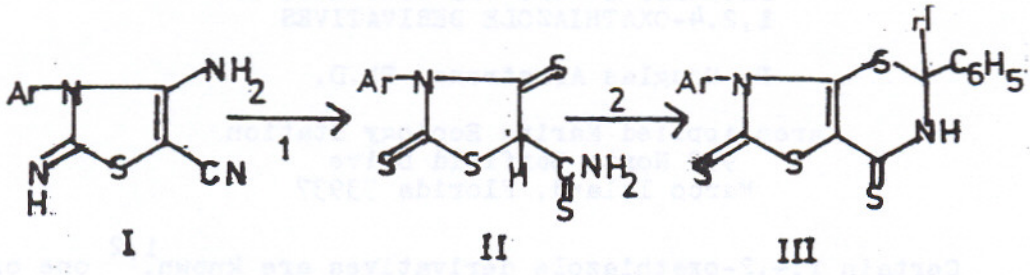
REACTIONS OF SULPHYDRIL NUCLEOPHILES WITH 4-AMINO-5-CYANO-2-(3H)-IMINO-Δ^4-THIAZOLINES; A FACILE SYNTHESIS OF SPIROTHIAZOLE SYSTEMS

Amrik Singh, T.K. Bindal and Prem Nath Maini

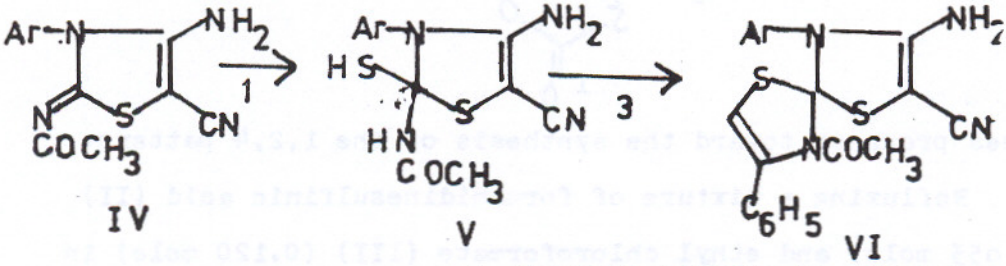
Chemistry Department, Guru Nanak Dev University, Amritsar-143005 (INDIA).

4-Amino-5-cyano-2(3H)-imino-3-phenyl-Δ^4-thiazoline(I) reacts with H_2S in hot pyridine or triethyl amino solution to yield 3-phenyl-2,4-dithia-5-thiocarbonamidothiazolidine(II) as indicated by the ir spectra and its conversion to 3-phenyl-5,6-dihydrothiazolo[4,5-e](1,3)thiazine-7-thione(III) on condensation with benzaldehyde in ethanol. 2(3H)-Acetylimino-4-amino-5-cyano-3-phenyl-Δ^4-thiazoline(IV) on the other hand undergoes addition of only one molecule of H_2S and yields V under the same conditions. This is revealed by the mass spectrum of V as well as its transformation to 6-acetyl-4-amino-3-cyano-5,7-diphenyl-5,6-diaza-2,9-dithiaspironona-3,7-diene(VI) on reaction with phenacyl chloride. The structure VI is supported by mass and other spectral data. 4-Amino-5-cyano-2-methylimino-3-phenyl-Δ^4-thiazoline condenses (VII) quite readily with thioglycollic acid and 3-mercaptopropionic acid to yield spirothiazole(VIII) and spirothiazine(IX) respectively.



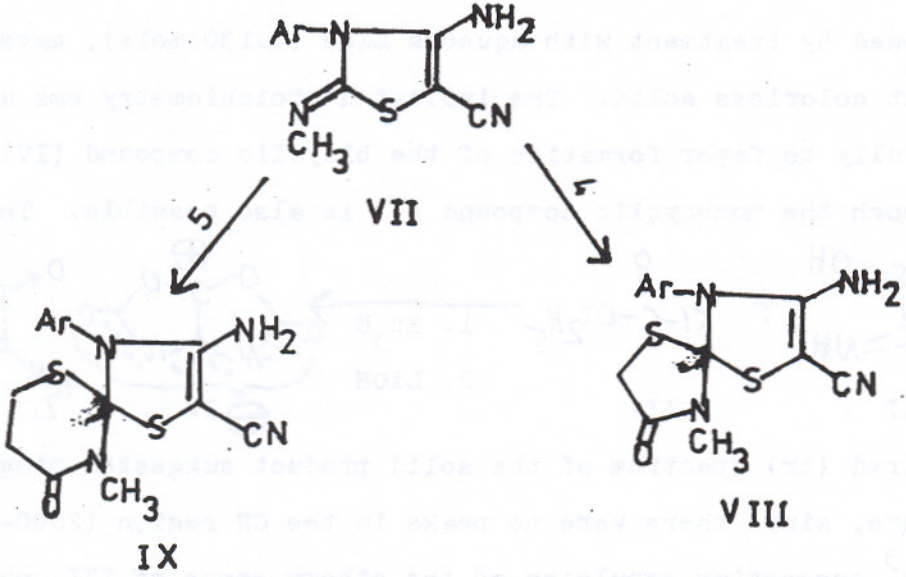
I II III

1. H_2S in hot pyridine 2. Benzaldehyde in ethanol



IV V VI

3. Phenacyl chloride in ethanol



VII IX VIII

5. 3-Mercaptopropionic acid 4. Thioglycollic acid