

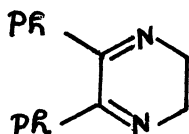
ADDITION OF HYDROGEN CYANIDE TO 2,3-DIPHENYL-5,6-DIHYDROPYRAZINE:
A LITERATURE CORRECTION

Jasjit Singh WALIA

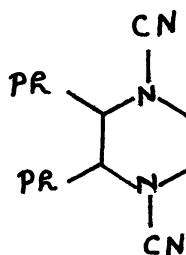
Department of Chemistry, Loyola University (New Orleans), New Orleans,
Louisiana 70118, U.S.A.

The structure of the product of reaction of 2,3-diphenyl-5,6-dihydropyrazine (1) with potassium cyanide and glacial acetic acid is established to be 2,3-dicyano-2,3-diphenyl-hexahydropyrazine (3) rather than the reported N, N'-dicyano-2,3-diphenyl-hexahydropyrazine (2).

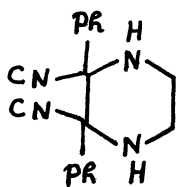
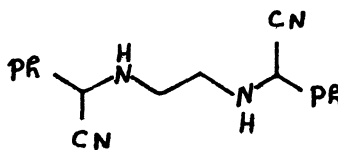
Eighty years ago Mason and Dryfoos¹ reported that the reaction of 2,3-diphenyl-5,6-dihydropyrazine² (1) with potassium cyanide and glacial acetic acid in ethanol gave in good yield a compound of mp 203-204°C. Since the hydrolysis¹ of this product with alcoholic potash did not afford the corresponding acid or the amide, they concluded that the CN groups in this compound were attached to nitrogen atoms and assigned it the N, N'-dicyano-2,3-diphenylhexahydropyrazine structure 2. Recently Bodfors³ has supported this structural assignment on the basis of its comparison with a compound of mp 123-124°C, obtained⁴ by the reaction of benzil with ethylenediamine, potassium cyanide and acetic acid in methanol; he believed this product to be 2,3-dicyano-2,3-diphenylhexahydropyrazine (3). Actually this product (mp 123-124°C) has been shown by Settimj and his coworkers⁵ to be bis α -aminonitrile 4. It has been further reported⁵ that the reaction of benzil with ethylenediamine and



1



2

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potassium cyanide in acetic acid gave a compound of mp 206-208⁰C, whose structure has been unequivocally shown to be dicyanopyrazine 3. We find that the compound of Mason and Dryfoos (mp 203-204⁰C) is the same as that of Settimj and his coworkers, *viz.*, compound 3, as shown by superimposability of their ir and nmr spectra and by mixture melting point. We conclude that the *N, N'*-dicyanopyrazine structure 2 for the product of reaction of 2,3-diphenyl-5,6-dihydropyrazine (1) with potassium cyanide and acetic acid is in error and is correctly represented by 2,3-dicyano-2,3-diphenylhexahydropyrazine (3). To the best of our knowledge the *N, N'*-dicyano compound 2 has never been synthesized.

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References

1. A.T. Mason and L.A. Dryfoos, *J.Chem. Soc.*, 63, 1293 (1893).
2. L.M. Amundsen, *J. Chem. Educ.*, 16, 566 (1939).
3. S. Bodforss, *Liebigs Ann. Chem.*, 745, 99 (1971).
4. W. Schlesinger, *Ber. dt. Chem. Ges.*, 47, 2406 (1914).
5. G. Settimj, F. Frascchetti, and S. Chiavaretti, *Gazz. Chem. Ital.*, 95, 885 (1965); *Chem. Abs.*, 64, 734e (1966).

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