The Glutarimide Dianion. A Convenient New Synthetic Intermediate

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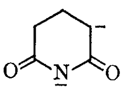
CONVENTIONAL methods for preparing α-substituted glutarimides normally involve a rather circuitous procedure in which introduction of the desired substitutent group into a suitable acyclic precursor is followed by cyclization to form the imide function.[1] Such methods are therefore limited to the synthesis of α-substituted glutarimides containing substituent groups which can be conveniently attached to a suitable acyclic system and which will not undergo undesirable side reactions during the final cyclization step.

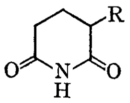
We now report a potentially versatile, one-step method for the synthesis of α-substituted glutarimides using the dianion (I), which is prepared from glutarimide by means of two molecular equivalents of sodamide[2] in liquid ammonia. Thus, treatment of (I) in this medium with benzyl chloride and n-butyl bromide produced (II) (R = PhCH$_2$;[3] and R = Bu^n, m.p. 97—98°)† in 79 and 77% yield, respectively. Acidic hydrolysis of these alkyl derivatives afforded the appropriate α-substituted glutaric acids in excellent yields.

Dianion (I) also underwent a carbonyl addition reaction with benzophenone to form (III), m.p. 186—187·5°,† in 57% yield, and aroylation with methyl anisate to afford (IV), m.p. 169—170°,† in 76% yield.

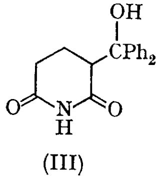
These reactions serve to demonstrate the potential synthetic utility of dianion (I) for the preparation of both known compounds and interesting new compounds which would be difficult to synthesize by more conventional methods.



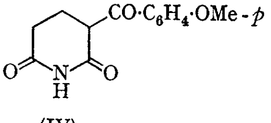
(I)



(II)



(III)



(IV)

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† Satisfactory analytical and spectral data have been obtained for this compound.

[1] See for example, T. Kametani, W. Taub, and D. Ginsburg, *Bull. Chem. Soc. Japan*, 1958, **31**, 857.

[2] Potassium amide, which has been used to prepare related dianions (D. R. Bryant and C. R. Hauser, *J. Amer. Chem. Soc.*, 1961, **83**, 3468, and R. F. C. Brown, *Austral. J. Chem.*, 1964, **17**, 154) was also satisfactory for the preparation of (I).

[3] T. Y. Yu and M. Y. Huang, *Acta Chim. Sinica*, 1959, **25**, 146 (*Chem. Abs.*, 1960, **54**, 4565e).