Commumications to the Editor

Preparation of 2-Cyclopenten-1-one.*

None of the older published methods for the synthesis of 2-cyclopenten-1-one (I) is satisfactory for the preparation of more than the smallest amounts of this useful intermediate[1,2]. A recent report of the synthesis of (I) in approx. 25% (crude) yield by dehydrochlorination of 2-chlorocyclopentanone with sodium methoxide[3] prompts us to describe a more efficient preparation which we have developed.

Treatment of 2-chlorocyclopentanone with hot 2,4,6-collidine results in ready dehydrochlorination of this substance with the formation of (I) in 54% yield. Pure (I) is easily isolated from the reaction mixture and can be prepared in considerable quantities since the dehydrochlorination can be run on a large scale without difficulty. 2-Bromocyclopentanone undergoes dehydrohalogenation more rapidly than does the chloroketone and affords (I) in somewhat higher yield. The chloroketone is to be preferred as the starting material, however, since it is more readily prepared and is more stable than the bromoketone.

(I)

Experimental

2-Cyclopenten-1-one (I)—A solution of 23.3g. of 2-chlorocyclopentanone[4] in 30 g. of 2,4,6-collidine (free from non-basic impurities, b.p. 169~171°) was heated rapidly to the boiling point and maintained at gentle reflux for 5 minutes. During the heating period a vigorous reaction ensued which was accompanied by the precipitation of collidine hydrochloride. The reaction mixture was subjected to distillation at 10 mm. pressure and the distillate was collected in a receiver which was cooled to −70°. Ether was added to the distillate (18 g.) and the etheral solution was washed with 13 cc. of 6*N* hydrochloric acid and dried over magnesium sulfate. Distillation of the liquid remaining after careful evaporation of the ether afforded 8.7 g. (54%) of (I), b.p_{15} 53°, $n_D^{18.2}$ 1.4780.

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* Part of the work done by K. Osugi (大杉邦三) during his study at the University of Illinois in 1951~1952.

1) cf. M. Godchot, F. Taboury: Compt. rend., 156, 332 (1913); *idem*: Bull. soc. chim. France, [4], 13, 545 (1913); E. Dane, K. Eder: Ann., 539, 207 (1939).
2) M. Mousseron, J. Jullien, F. Winternitz: Bull. soc. chim. France, 1948, 878, reported the synthesis of (I) from α-chlorocyclopentanone by a two-step process in 40% yield. We have been unable to prepare (I) according to their procedure.
3) M. Mousseron, R. Jacquier, A. Fontaine: Bull. soc. chim. France, 1952, 767.
4) A. Kötz, K. Blendermann, E. Kárpáti, R. Rosenbusch: Ann., 400, 47 (1913).