

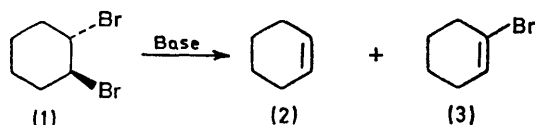
## 1-Bromocyclohexene from *trans*-1,2-Dibromocyclohexane; a $\beta$ -Elimination by a "Complex Base"

By P. CAUBÈRE\* and G. COUDERT

(Laboratoire de Chimie Organique I, Université de Nancy I, BP 140-54037, Nancy, France)

**Summary** The action of  $\text{NaNH}_2$ - $\text{Bu}^t\text{ONa}$  on *trans*-1,2-dibromocyclohexane under mild conditions gives 1-bromocyclohexene in good yield.

A SURVEY of the literature on  $\beta$ -eliminations brought about by bases, shows that *syn*-eliminations<sup>1</sup> are useful synthetically. There is evidence that the nature and structure of the



Action of bases on *trans*-1,2-dibromocyclohexane (1) (40 mm) in THF at 20° for 22 h

Base (mm)	(1)	Product (%)	(2) <sup>a</sup>	(3) <sup>a</sup>
NaNH <sub>2</sub> (180)	.. ..	90	trace	0
Bu <sup>t</sup> ONa (180)	.. ..	70—75	0	trace
NaNH <sub>2</sub> -Bu <sup>t</sup> ONa (120—160)		0	36	60 <sup>b</sup>

<sup>a</sup> Measured by g.l.c. using the internal standard method.

<sup>b</sup> Isolated pure: 50—55%.

bases used are important in these reactions.<sup>2</sup> Our previous work has shown that "complex bases"<sup>3</sup> can remove a proton under abnormal conditions,<sup>3,4</sup> and also favour *syn*-eliminations in halogenobenzenes<sup>5</sup> and 1-chlorocyclohexenes.<sup>6</sup> Proof of the generality of the latter property was obtained from preparing some acetylenic hydrocarbons difficult to obtain by other means.<sup>7</sup> This result led us to a study of the synthesis of 1-bromocyclohexene from *trans*-1,2-dibromocyclohexane. To our knowledge, no satisfactory method has so far been found for this.<sup>8</sup> Treatment of the dibromo-compound (1) with base produces (2) and (3) (see Table). Compound (2) results from debromination as occurs with compounds having two antiparallel bromine

atoms,<sup>8</sup> whereas (3) can only be formed as the result of *syn*-elimination. The behaviour of the "complex base" (NaNH<sub>2</sub>-Bu<sup>t</sup>ONa) is different of that of either NaNH<sub>2</sub> or Bu<sup>t</sup>ONa used separately.

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