**Direct Photochemical
cis-trans Isomerization with
185 nm Radiation:
A Facile Preparation of
cis-Di-tert-butylethylene**

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On irradiation of *trans*-di-*tert*-butylethylene at 185 nm in pentane the sterically congested *cis*-isomer was formed in *ca.* 40%. This π - π^* excitation constitutes a convenient, direct method for the preparation of such usually difficult to prepare olefins.

Triplet ketone sensitization is one of the common methods for the *cis-trans* isomerization of olefins [1]. However, (2+2)-cycloaddition between the excited ketone and olefin can be a serious side reaction [2]. Moreover, sterically congested olefins such as *trans*-di-*tert*-butylethylene (**1a**) cannot be isomerized *via* such indirect photochemical methods into the *cis*-isomer (**1b**).

Recently it has been shown [3] that 185 nm radiation is effective in directly isomerizing *cis*-cyclooctene into its *trans*-isomer. The formation of this strained cycloalkene was the result of π - π^* excitation. Consequently, we expected that the isomerization of *trans*-(**1a**) into *cis*-(**1b**) could be effected through such direct π - π^* excitation with 185 nm. Indeed, irradiation of a *ca.* 0.15 M solution of **1a** in pentane (Baker Photrex) at 185 nm, using a 50 W mercury resonance lamp as light source, led within 10 h to a photostationary state of *ca.* 40% *cis*-isomer (**1b**), as monitored by gas chromatography. Fractional distillation on a 15 cm spinning band column afforded the pure **1b**, b.p. 144 °C/760 Torr (lit. [4] b.p. 144 °C/748 Torr); ^1H NMR (CCl_4 , TMS) δ (ppm) 0.95 (s, 18H) and 5.10 (s, 2H).

Compared with the existing synthetic methods of preparing such sterically congested *cis*-olefins, *e.g.* *cis*-**1b** was previously prepared via the classical but cumbersome route using as last step *cis*-hydrogenation of di-*tert*-butylacetylene [4], the convenience of the direct photochemical isomerization with 185 nm radiation is clearly evident. It appears, therefore, that this novel and facile process is of potential synthetic utility.

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