

COMPARATIVE CLEAVAGE OF *tert*-BUTOXYCARBONYL
AND BENZYLISOPROPOXYCARBONYL DERIVATIVES
OF AMINO ACIDS

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We have previously shown [1] that the reaction of salts of amino acids with di-2-benzylisopropyl pyrocarbonate forms *N*-2-benzylisopropoxycarbonyl derivatives of amino acids (*N*-BPOC-amino acids). The present paper gives the results of an investigation of the conditions for the removal of the *N*-BPOC group and a comparison of the stability of the *N*-*tert*-butoxycarbonyl (BOC) and BPOC groups under the action of the reagents generally used for removing the *N*-BOC protection of amino acids.

To solve this problem, we investigated the time for the complete cleavage of BOC- and BPOC-glycines under the action of a solution of trifluoroacetic acid in methylene chloride (1:1), of a 1 N solution of hydrogen chloride in glacial acetic acid, and of a 1 N solution of boron trifluoride etherate in glacial acetic acid [2].

Weighed samples of BOC- or BPOC-glycine (1 mg) were dissolved in 1 ml of cleavage reagent, and after predetermined intervals 0.1-ml samples of the reaction mixture were taken and were mixed with 0.1 ml of a 1 N solution of NaOH in methanol to stop the reaction. Then the sample no longer containing the initial BOC- or BPOC-glycine was determined chromatographically [Silufol plates, benzene-chloroform-acetic acid (20:20:2)], and the time of taking this sample (after refining it in a repeat experiment) was taken as the time of complete cleavage of the corresponding derivative. It was established in preliminary experiments that the spots of BOC- and BPOC-glycines at concentrations of 1% of the initial amount are clearly shown on a thin-layer chromatogram by ninhydrin at 120°C. Consequently, the completeness of the cleavage of the *N*-substituted derivatives found corresponds to not less than 99% of the initial amount (Table 1). The results obtained show that under identical conditions the amount of time required for the complete removal of the *N*-BPOC protective group is approximately ten times that for the BOC group, although in both cases the reaction begins immediately after the mixing of the reagents (glycine appears in samples taken 1 min after mixing).

Similar results were obtained in the cleavage of the BOC and BPOC derivatives of leucine.

TABLE 1. Time of Complete Removal of the *N*-Protective Groupings from Glycine, min

Reagent	CF ₃ COOH- -CH ₂ Cl ₂ 1:1	1 N HCl in CH ₃ COOH	1 N BF ₃ ·C ₂ H ₅ O in CH ₃ COOH
BOC-Gly	5-6	5-6	7-8
BPOC-Gly	30-32	40-45	55-60

LITERATURE CITED

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