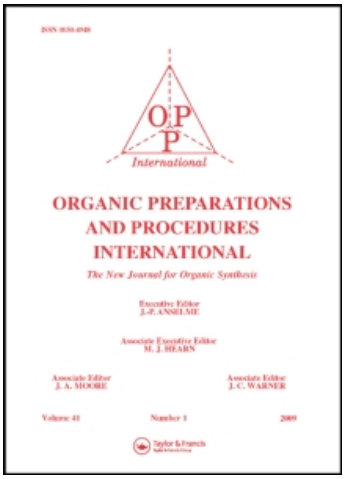

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PREPARATION OF *N*-TRITYLPYRROLIDINE AND *N*-TRITYLPIPERIDINE

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PREPARATION OF *N*-TRITYLPYRROLIDINE AND *N*-TRITYLPIPERIDINE

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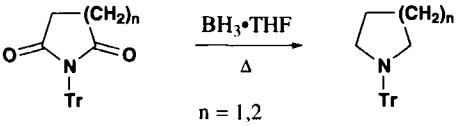
In connection with our ongoing radiopharmaceutical program, it became necessary to synthesize *N*-tritylpyrrolidine (*N*-triphenylmethylpyrrolidine) and *N*-tritylpiperidine (*N*-triphenylmethylpiperidine) in large quantities. It has been reported[1] that the reduction of *N*-tritylsuccinimide with lithium aluminum hydride results in the formation of *N*-trityl-γ-hydroxybutyramide but none of the expected *N*-tritylpyrrolidine. We recently reported[2] the use of borane to reduce various alkyl diphenimides to dibenz[c,e]azepines which are potent antihyperlipidemics.[3] We also described the preparation of hindered *N*-aryl cyclic amines *via* the reduction of *N*-aryl cyclic imides utilizing borane-THF.[4] We now report a convenient preparation of *N*-tritylpyrrolidine and piperidine *via* the reduction of *N*-tritylsuccinimide and *N*-tritylglutarimide with borane-THF.



The requisite *N*-tritylsuccinimide or *N*-tritylglutarimide was prepared by reaction of *N*-bromosuccinimide or *N*-bromoglutarimide with trityl bromide in refluxing chloroform.[1] The reduction of these imides with borane in refluxing tetrahydrofuran afforded *N*-tritylpyrrolidine and *N*-tritylpiperidine in 81% and 69% yield, respectively.

EXPERIMENTAL SECTION

N-Bromosuccinimide, trityl bromide and borane-THF were used as received from the Aldrich Chemical Company. *N*-Bromoglutarimide was prepared from glutarimide according to literature method.[5]

Melting points were measured on an Electrothermal Digital Melting Point Apparatus and are uncorrected. ^{1}H and ^{13}C NMR spectra were recorded on Bruker AC 250 MHZ NMR spectrometer. The chemical shift values are expressed in parts per million (δ) relative to tetramethylsilane. All reactions were carried out in dry commercially available solvents under inert atmosphere.

Reduction of *N*-Tritylsuccinimide and *N*-Tritylglutarimide.- A dry, three-necked, 500 mL round bottomed flask was equipped with magnetic stirrer, reflux condenser and a 100 mL graduated dropping funnel. *N*-Tritylsuccinimide (3.41 g; 10 mmol) or *N*-tritylglutarimide (3.55 g; 10 mmol) was added to the flask along with anhydrous THF (100 mL) and the solution was cooled to 0° in an ice bath. Commercial borane in THF (60 mL of 1.0 N solution; 60 mmol) was transferred to the dropping funnel by cannulation and then added slowly over 0.5 h. The reaction mixture was refluxed for 6 h. Excess borane was decomposed (CAUTION: hydrogen evolved) by quenching with methanol (20 mL) and the reaction mixture was poured onto crushed ice. The product was extracted into ether (3 X 100 mL), dried over anhydrous of sodium sulfate, the solvent evaporated and the product purified by recrystallization from petroleum ether to afford colorless *N*-tritylpyrrolidine (2.54 g) or *N*-tritylpiperidine (2.24 g).

***N*-Tritylpyrrolidine**: 81% yield; mp. 124-125° (lit.[1] 126-127°); ^{1}H NMR ($CDCl_3$): δ 1.71 (*t*, 4H, H-3 and H-4), 2.41 (*t*, 4H, H-2 and H-5), 7.01-7.35 (*m*, 9H) and 7.5 (*d*, $J_{2,3}$ = 7.5 Hz, 6H). ^{13}C NMR ($CDCl_3$): δ 21.62, 45.73, 73.81, 125.31, 126.67, 128.85 and 142.47.

N-Tritylpiperidine: 69% yield; mp. 158-160°; ^{1}H NMR ($CDCl_3$): δ 1.65 (*t*, 2H, H-4), 1.95 (*m*, 4H, H-3 and H-5), 3.20 (*t*, 4H, H-2 and H-6), 7.02-7.40 (*bs*, 15H). ^{13}C NMR ($CDCl_3$): δ 25.24, 26.99, 49.72, 77.90, 126.03, 127.58, 129.55 and 142.87.

Anal. Calcd for $C_{24}H_{25}N$: C, 88.02; H, 7.69, N, 4.27. Found: C, 88.00; H, 7.72; N, 4.28

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