$C \rightarrow N$ and $N \rightarrow C$ solution phase peptide synthesis using the *N*-acyl 4-

nitrobenzenesulfonamide as protection of carboxylic function

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Supporting Information

NMR spectra of compounds 2, 4a-n, 5a-i, k-n, 7a-i, k-n, 8j, 9j, 10j and 11j

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4-nitrobenzenesulfonamide (2)





¹³C NMR



N-Fmoc-L-valinyl-4-nitrobenzenesulfonamide (4a,e)









N-Fmoc-L-phenylalanyl-4-nitrobenzenesulfonamide (4b)







N-Fmoc-L-alanyl-4-nitrobenzenesulfonamide (4c,l)





N-Fmoc-L-leucinyl-4-nitrobenzenesulfonamide (4d)





N-Fmoc-D-phenylalanyl-4-nitrobenzenesulfonamide (4f)





¹³ C NMR



N-Fmoc-O-tBu-L-serinyl-4-nitrobenzenesulfonamide (4g)





N-Fmoc-O-tBu-L-tyrosinyl-4-nitrobenzenesulfonamide (4h)

¹H NMR



N-Fmoc-O-tBu-L-glutamyl-4-nitrobenzenesulfonamide (4i)

¹H NMR



N-Fmoc-L-isoleucinyl-4-nitrobenzenesulfonamide (4j)







S10

N-Fmoc-D-valinyl-4-nitrobenzenesulfonamide (4k)





N-Fmoc-*D*-alanyl-4-nitrobenzenesulfonamide (4m)

¹H NMR



N-Fmoc-O-tBu-D-serinyl-4-nitrobenzenesulfonamide (4n)

¹H NMR



N-Fmoc-L-valinyl-N-methyl-4-nitrobenzenesulfonamide (5a,e)





¹³C NMR



N-Fmoc-L-phenylalanyl-N-methyl-4-nitrobenzenesulfonamide (5b)

¹H NMR



N-Fmoc-L-alanyl-N-methyl-4-nitrobenzenesulfonamide (5c,l)

¹H NMR



N-Fmoc-L-leucinyl-N-methyl-4-nitrobenzenesulfonamide (5d)

¹H NMR



¹³ C NMR



N-Fmoc-*D*-phenylalanyl-N-methyl-4-nitrobenzenesulfonamide (5f)

¹H NMR







N-Fmoc-O-tBu-L-serinyl-N-methyl-4-nitrobenzenesulfonamide (5g)

¹H NMR



N-Fmoc-O-tBu-L-tyrosinyl-N-methyl-4-nitrobenzenesulfonamide (5h)

¹H NMR



N-Fmoc-O-tBu-L-glutamyl-N-methyl-4-nitrobenzenesulfonamide (5i)

¹H NMR



120 110 100

90 80 70

60 50 40 30 20

ppn

170 160 150 140 130

190 180

N-Fmoc-D-valinyl-N-methyl-4-nitrobenzenesulfonamide (5k)

ا كا أطر يوم الم إن

170 160 150 140 130 120 110

100

90 80 70 60

50 40 30 20

ppm

180

190





N-Fmoc-D-alanyl-N-methyl-4-nitrobenzenesulfonamide (5m)

¹H NMR



¹³C NMR



N-Fmoc-O-tBu-D-serinyl-N-methyl-4-nitrobenzenesulfonamide (5*n*)

¹H NMR



¹³C NMR





¹H NMR







N-Fmoc-L-phenylalanyl-L-alanine methyl ester (7b)







¹H NMR



N-Fmoc-L-leucinyl-L-alanine methyl ester (7d)





N-Fmoc-L-valinyl-D-alanine methyl ester (7e)





N-Fmoc-D-phenylalanyl-L-alanine methyl ester (7f)





N-Fmoc-O-tBu-L-serinyl-L-alanine methyl ester (7g)





N-Fmoc-O-tBu-L-tyrosinyl-L-alanine methyl ester (7h)





N-Fmoc-O-tBu-L-glutamyl-L-alanine methyl ester (7i)





N-Fmoc-D-valinyl-L-alanine methyl ester (7k)





N-Fmoc-L-alanyl-L-valine methyl ester (7l)

¹H NMR







N-Fmoc-D-alanyl-L-valine methyl ester (7m)









N-Fmoc-O-tBu-D-serinyl-L-alanine methyl ester (7n)







Figure a) ¹H NMR spectrum of Fmoc-L-valinyl-D-alanine methyl ester (**7e**), b) ¹H NMR spectrum of Fmoc-L-valinyl-L-alanine methyl ester (**7a**), c) ¹H NMR spectrum of a mixture of **7e** (19 mg) and **7a** (11 mg).

N-Fmoc-L-phenylalanyl-L-isoleucinyl-4-nitrobenzenesulfonamide (8j)









N-Fmoc-L-phenylalanyl-L-isoleucinyl-N-methyl-4-nitrobenzenesulfonamide (9j)

¹H NMR



N-Fmoc-L-phenylalanyl-L-isoleucine (10j)

¹H NMR



N-Fmoc-L-phenylalanyl-L-isoleucinyl-L-alanine methyl ester (11j)

¹H NMR





