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Diastereoselective synthesis of 2-alkylated 4-silyloxyproline esters

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Treatment of the 4-silyloxy-N-Boc-L-proline methyl ester 1 with allyl bromide in the presence of LDA in THF at -78°C gives a mixture of the (2S,4R)- and (2R,4R)-2-(prop-2-enyl)-4-silyloxy-N-Boc-L-proline esters 2a and 2b in 75% combined yield in the ratio 53: 47. In contrast, similar treatment of the (-)- and (+)-menthyl esters 3 and 4 gives a mixture of alkylated products 5a,b and 6a,b in the ratio 75: 25 and 89: 11, respectively. Reaction of 4 with methyl iodide and propyl iodide also give the corresponding 2-alkylated esters 7a and 7b in a highly diastereoselective manner (94: 6 and 93: 7, respectively).