FUNCTIONALIZED CROWN ETHERS AS AN APPROACH TO ENZYME MODELS FOR THE SYNTHESIS OF PEPTIDES

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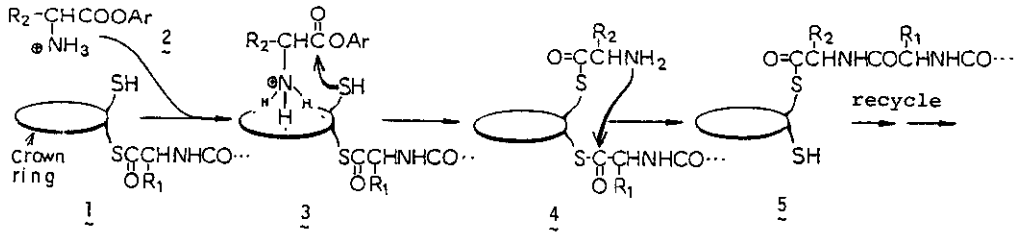
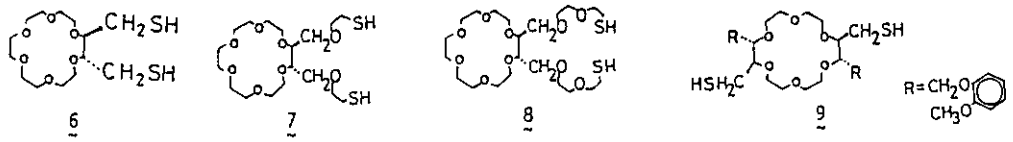
Formation of highly structured molecular complex between enzyme and its substrate prior to the reaction is known to play an essential role in the enzyme-catalyzed reactions. As a part of our research program directed toward the realization of this principle in the artificial reactions, we tried to design a sequence of reactions to catalyze the formation of peptides using crown ethers that gather two substrates via host-guest complexation as shown below.

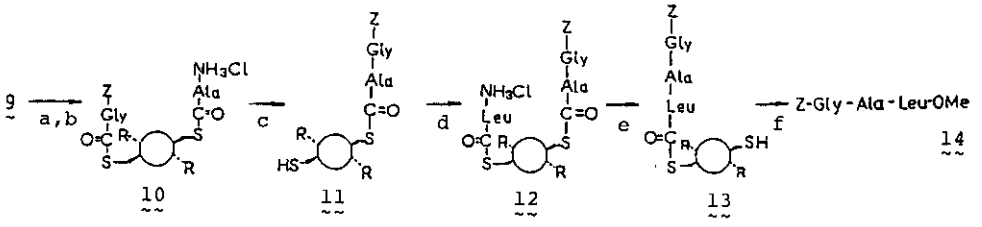


1 3 4 5

Crown ethers (6, 7, 8, 9, etc.) were synthesized and their reactivities were examined. The results with 9 are shown below.



6 7 8 9



10 11 12 13 14

a) Z-Gly-OH, DEPC, DMF. b) L-Ala-ONp·HBr, pyridine, rt, 30 min. c) TEA, ^{t}BuCOOH, benzene, 1 day. d) L-Leu-ONp·HBr, pyridine, rt, 30 min. e) TEA, ^{t}BuCOOH, benzene, 3 days. f) Na_2CO_3, MeOH, rt, 2 hr.