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PEPTIDE REAGENTS

It is the Aldrich tradition to help the synthetic chemists by offering a wide variety of intermediates and reagents. Take peptide synthesis, we generally offer one or two reagents for each peptide coupling method described in the literature to date. As each method or reagent has some disadvantages as well as advantages, a variety of reagents is necessary.

For the classic "mixed anhydride" method, we offer isobutyrl and ethyl chloroformate. Generally, isobutyl chloroformate is preferred for the preparation of peptides of moderate or high molecular weight whereas ethyl chloroformate is preferred for the synthesis of dipeptides. The carbodiimide method is another versatile and convenient method. The most popular DCC is a highly active reagent and can be used in solid-phase peptide synthesis (SPPS). Related reagents 1-cyclohexyl-3-(2-morpholinoethy)carbodiimide methyl-p-toluene sulfonate and 1-(3-dimethylaminopropyl)-3-ethylcarbodiimide hydrochloride are water-soluble diimides, which permit simplified purification of the peptide product because the corresponding ureas are water-soluble. Racemization in the DCC method can be minimized or completely suppressed by using an additive, such as N-hydroxysuccinimide, N-hydroxysphthalimide, N-hydroxypropyridine or 1-hydroxybenzotriazole. The latter is exceptionally good at retarding racemization, prohibiting N-acyleurea formation, and at improving yields of high-purity peptides. These additives, of course, can be used in SPSS.

The use of DCC-pentachlorophenol (PCP) and DCC-pentafluorophenol (PFP) complexes in the preparation of acylpeptide-PCP and -PFP active esters, and other uses of DCC have been described.

Another equally versatile reagent is EEDQ which has many more advantages: volatile and easily removable by-products, practically no racemization, usable with O-protected hydroxy amino acids. EEDQ and its more reactive analog IDQ, another Aldrich first, are also good for SPSS. Woodward's reagents K and L offer similar advantages: high yields, water soluble by-products, and usable with O-protected hydroxy amino acids. An oxidation-reduction condensation method calls for Aldrihol-2 (2,2'-dipyridyl disulfide) and triphenylphosphine as coupling reagents. This system can be used in a variety of solvents at a wide range of temperatures, affords high yields and little racemization, and can be used in SPSS.

A selection of other reagents we sell are: pivaloyl chloride, triphenylphosphine oxide, chloroform, ethyl chloroformate, diethylaminosuccinimide, N-hydroxy succinimide, N-hydroxyphthalimide, N-hydroxylpiperidine, and 1-hydroxybenzotriazole. These reagents, as well as the above, can be used in SPSS.

**References**

1. For a summary of recent reviews, symposia, and books on this subject, see J. M. Steward, Angew. Med. Chem., 2, 293 (1972).
2. See also E. S. Krasner and E. Bodansky, Synthesis, 1972, 453.

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<td>17,798-9</td>
<td>Isobutyrl chloroformate</td>
<td>C8H15NO2</td>
<td>25g $3.25, 100g $7.50</td>
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<tr>
<td>E1710-0</td>
<td>Ethyl chloroformate</td>
<td>C8H15NO2</td>
<td>108.5g $2.70, 500g $4.20</td>
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<tr>
<td>DB8000-0</td>
<td>DCC</td>
<td>C12H19NO2</td>
<td>20.6g $3.00, 25g $3.00, 100g $10.00, 1kg $45.00, 10kg $320.00</td>
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<td>C10,640-2</td>
<td>I-Cyclohexyl-3-(2-morpholinoethyl)carbodiimide metho-p-toluene sulfonate</td>
<td>C25H35N2O2S</td>
<td>25g $20.00</td>
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<td>16,146-2</td>
<td>1-(3-Dimethylaminopropyl)-3-ethylcarbodiimide hydrochloride</td>
<td>CH32N3O1HCl</td>
<td>1g $4.50, 10g $29.75</td>
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<td>15,726-0</td>
<td>1-Hydroxybenzotriazole monohydrate</td>
<td>C20H17N2O3</td>
<td>25g $10.50, 100g $28.00</td>
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<td>13,067-2</td>
<td>N-Hydroxysuccinimide</td>
<td>C5H9N2O2</td>
<td>11.5g $7.20, 25g $13.85, 100g $37.25</td>
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<td>15,724-0</td>
<td>N-Hydroxysphthalimide</td>
<td>C7H6N2O2</td>
<td>16.3g $3.50, 100g $10.10, 500g $33.60</td>
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<td>12,884-4</td>
<td>N-Hydroxypropyridine</td>
<td>C8H11N2O2</td>
<td>1g $5.30, 15g $17.55</td>
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<td>14,016-3</td>
<td>Pentachlorophenol</td>
<td>C12H7Cl5O</td>
<td>3kg $8.20</td>
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<td>10,379-9</td>
<td>Pentafluorophenol</td>
<td>C12H7F5O</td>
<td>10g $18.20</td>
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<td>15,207-2</td>
<td>EEDQ</td>
<td>C8H7NO2</td>
<td>25g $6.25, 100g $16.75, 247.3g $39.50</td>
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<td>IDQ</td>
<td>C8H7NO2</td>
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<td>E4526-0</td>
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<td>C10H11N2O2</td>
<td>5g $16.50, 30g $66.00</td>
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<td>B9695-3</td>
<td>Woodward's reagent L</td>
<td>C10H11N2O2</td>
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<td>14,304-9</td>
<td>Aldrihol-2 (2,2'-dipyridyl disulfide)</td>
<td>C12H10N2O4S2</td>
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<td>T8440-9</td>
<td>Triphenylphosphine</td>
<td>C18H15NO</td>
<td>100g $6.30, 262.3g $14.25, 1kg $41.80</td>
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<td>T7260-5</td>
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<td>C15H24O2</td>
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<td>T8465-4</td>
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<td>C18H15NO</td>
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<td>I20-2</td>
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<td>11,5533-3</td>
<td>1,1'-Carbonyldimidazole</td>
<td>C10H9N2O2</td>
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