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BIOCHEMICALS of Special Interest

We often speculate about the use of some of the compounds added to our catalog. Some fascinating applications have emerged...

Thus, 3-chloro-1,2-propanediol in oral or intraperitoneal doses of 50 mg/kg renders male rats infertile without inhibiting their ability to mate (1, 2). Hexamethylphosphoramide has a similar effect but also blocks spermatogenesis (3). O-Phthalicacidcarboxaldehyde is used for the fluorometric estimation of histidine (4) and for staining intradermal sweat ducts (5). p-Hydroxyphenylacetic acid is a substrate for the fluorometric assay of oxidative enzymes or of sugars (6), 2-Amino-1,3-tricyanopropene inhibits oxygen evolution in photosynthesis (7), uncouples oxidative phosphorylation in mitochondria (8) and is a specific reagent for the fluorometry of Cu(II) in the concentration range of 15-60 ng/ml (9). 3,4-Dihydroxybenzaldehyde is a fungistat in the skin of green Cavendish bananas (10). 2-Phenoxyethanol is a useful preservative of proteins and enzymes in tissues (11). The nitration of the vinyl groups of ferrithene by tetraniomethane was an interesting finding (12).

PEPTIDE SYNTHESIS

Since the description of the synthesis of N,N'-dicyclohexylcarbodimide (DCC) (13), we have synthesized N,N'-carbonyldiimidazole (14) which gives less racemization than DCC (15). We list tert. butyloxycarbonyl azide (16) and 3,5-dimethyl-1,3-cyclohexanedione (17) for blocking amino groups as well as N-hydroxyphosphamide (18), 8-hydroxyquinoline (19), N-hydroxy-succinimide (20) and N-ethyl-S-phenylisoxazolium-3-sulphonate (Woodward's reagent K) (21) to make activated esters for peptide synthesis. A new reagent for facilitating peptide bond formation with DCC with minimal racemization is 1-hydroxybenzotriazole (22). Another interesting method with low racemization uses our reagent 2,2'-dithiodipropiridine (Alldrich-2) in the reaction

\[ \text{XNH-CHR} \rightarrow \text{COOH} + \text{H}_2\text{N-CHR-CONH-COOC-PhPO} + 2 \text{P} \]

In our hands the peptide and amide reagent of choice is EEDQ (24, 25, 26), because there is practically no racemization and the byproducts are liquids (quinoline and ethanol) and a gas (CO$_2$), leaving the peptide as the only solid residue.

INHIBITORS OF DOPAMINE HYDOXYLASE (DopH)

The activity of DopH varies in different parts of the human brain (27). Differentaryl and alkylic thiores are inhibitors of DopH in vitro; one of the most potent is 1-phenyl-3-(2-thiazolyl)-2-thiourea which inhibits 50% at 1.5 x 10$^{-4}$ M concentration (28). In vitro this compound (200 mg/kg) significantly raises the levels of dopamine and depresses those of norepinephrine in brains of mice or rats (28). Even a single dose of 25 mg/kg significantly reduces norepinephrine in the brains of mice or rats (29). Similar findings have been reported from another laboratory (30).

References