

**ABSTRACTS \***

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\* The references given in this section cover articles drawn from 40 primary periodicals and also from N.S.A. and C.A.

A point is made of singling out information about synthesizing and related problems particularly where the main part of the abstracted article deals with applications.

Author and subject indexes will be published for each volume of this journal.

The results obtained from May 1964 until December 1964 have been published in Euratom reports EUR 2212 e and EUR 2212 e supplement.

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## 1 — SYNTHESIS

## 1.0 — Deuterium compounds

## 1.0.1 — GENERAL

1.0.2 — ALIPHATIC  
COMPOUNDS

## 66-169

COPE A. C., KINNEL R. B.

**Proximity effects. XLIV. Stereospecific synthesis and solvolysis of cis- and trans-5-phenylcyclooctyl and cis- and trans-5-phenylcyclooctyl-1,2,2,8,8-d<sub>5</sub> tosylates.**

J. Am. Chem. Soc. **88**, 752 (1966)

5-Phenylcyclooctanone (I) in MeOD/  
K<sub>2</sub>CO<sub>3</sub>, → 1-2,2,8,8-d<sub>4</sub>, + LiAlD<sub>4</sub>, +  
3,5-dinitrobenzoic acid → 1-1,2,2,8,8-d<sub>5</sub>  
3,5-dinitrobenzoate, hydrolysis, crystallisa-  
tion → cis-5-phenylcyclooctanol-1,2,2,8,8-  
d<sub>5</sub> (II). II → corresp. tosylate, boiling in  
tetraethylammonium acetate, cleavage with  
LiAlH<sub>4</sub> → 21% trans-5-phenylcycloocta-  
nol-1,2,2,8,8-d<sub>5</sub>.

## 66-170

FRITZ H., BUDZIKIEWICZ H.,  
DJERASSI C.

**Einfluss behinderter Rotation sowie anderer energetischer Faktoren auf die McLafferty-Umlagerung von Ketonen.**

Chem. Ber. **99**, 35 (1966)

Addn. of 2-iodobutane-3,3-d<sub>2</sub> to the Mg-  
salt of N-cyclopentylidene cyclohexyl-  
amine → 1-sec-butylcyclopentan-2-one-3',  
3'-d<sub>2</sub>. Yield: 10%.

## 66-171

GOLD V., KESSICK M.A.

**Hydrogen isotope effects in olefin hydration. The relationship of isotope effects to the mechanism of proton transfer from the hydronium ion.**

J. Chem. Soc. **1965**, 6718

tert.-Butyl alcohol- $\alpha$ -d from isobutene +  
sulfuryl chloride/99.95% D<sub>2</sub>O, 25°, 4 days.

## 66-172

HART H., COLLINS P. M.,  
WARING A. J.

**Preparation, chemistry, and photochemistry of hexaalkyl-2,4-cyclohexadienones.**

J. Am. Chem. Soc. **88**, 1005 (1966)

2,3,4,5,6,6-Hexamethyl-2,4-cyclohexadieno-  
ne-3-(methyl-d<sub>3</sub>) (I) by exchange in MeOD/  
NaOD. I + K-t-butoxide/dimethyl sulf-  
oxide-d<sub>6</sub> → corresp. 3,5-dimethyl-d<sub>6</sub> labeled  
deriv. (II). II + MeOH/NaOH → the 5-  
methyl-d<sub>3</sub> labeled deriv.

## 66-173

JERKUNICA J. M., BORCIC S.,  
SUNKO D. E.

**Base catalyzed deuteration of norcamphor and dehydronorcamphor.**

Tetrahedron Letters **1965**(49), 4465.  
CA **64**, 8241c (1966)

Norcamphor and soln. of D<sub>2</sub>O, methan ol-d,  
and NaOMe, 12 hrs. at 100° in a sealed  
ampul → 50% of 2 atoms D per mol, 65%  
after a second exchange. Dehydronorcam-  
phor in a single D exchange → 95% of 2  
atoms D per mol.

## 66-174

KLOOSTERZIEL H., TER BORG A. P.

**Kinetic protium-deuterium isotope effect in an intramolecular 1-5 shift of hydrogen.**

Rec. Trav. Chim. **84**, 1305 (1965)  
CA **64**, 3300b (1966)

1,3,6-Cyclooctatriene-5,8-d<sub>2</sub> as follows:  
Zn and NaOD added over 28 hrs. to  
cyclooctatetraene, CuSO<sub>4</sub>, and EtOD, the  
mixt. dild. with H<sub>2</sub>O, extd. with Et<sub>2</sub>O, the  
ext. distd., and the fraction b<sub>60</sub> 67-8° sub-  
jected to preparative GLC; yield 20%.

## 66-175

THOMAS A. F., WILLHALM B.

**Mass spectra and organic analysis. Part VII. The mass spectra of the menthols, carvomenthols, their acetates and related alcohols.**

J. Chem. Soc. (B) 1966, 219.

2,2,4-d<sub>3</sub>-Menthyl acetate, pyrolysis at 400° → 2,4-d<sub>2</sub>-menth-2-ene (52%, isotopic purity 92%) and 2,2-d<sub>2</sub>-menth-3-ene (47%, isotopic purity 90%).

1,3,3-d<sub>3</sub>-Carvomethyl acetate, treated as above → 47% of 3,3-d<sub>2</sub>-menth-1-ene (19.5 d<sub>3</sub>, 71% d<sub>2</sub>, 9.5% d<sub>1</sub>) and 53% of 1,3-d<sub>2</sub>-menth-2-ene (91% d<sub>2</sub>)

#### 66-176

WEBER H., SEIBL J., ARIGONI D.

**Die absolute Konfiguration von 1-<sup>2</sup>H<sub>1</sub>-Äthanol.**

Helv. Chim. Acta 49, 741 (1966)

(-)-(2R,3S)-3-d<sub>1</sub>-2-Butanol by asym. hydroboration of cis-butene with optically active diisopinocampheyl borane.

(±)-threo- and (±)-erythro-3-d<sub>1</sub>-Butan-2-ol by redn. of the corresp. cis- and trans-epoxybutane with LiAlD<sub>4</sub>.

#### 66-177

WEINBERG D. S., DJERASSI C.

**Mass spectrometry in structural and stereochemical problems. LXXXVIII. Rearrangements of simple terpenes on electron impact.**

J. Org. Chem. 31, 115 (1966)

4-Methyl cyclohexanone + triphenylisopropylphosphonium bromide (I) in dimethyl-d<sub>6</sub> sulfoxide → Δ<sup>4(8)</sup>-menthene-3,3,5,5-d<sub>4</sub>, containing 70% d<sub>4</sub>, 20% d<sub>3</sub>, 5% d<sub>2</sub>, 3% d<sub>1</sub> and 2% d<sub>0</sub>.

Δ<sup>4(8)</sup>-Menthene-9,9,9,10,10,10-d<sub>6</sub> from 1-d<sub>6</sub>, 88% d<sub>6</sub>, 12% d<sub>5</sub>.

Camphor-3,3-d<sub>2</sub> by exchange in trifluoro-deuterioacetic acid/D<sub>2</sub>O, 130°, 9 days: 95% d<sub>2</sub>, 5% d<sub>1</sub>.

See also : 66-263, Methylketene-d

### 1.0.3 — AROMATIC COMPOUNDS

#### 66-178

BALIGA B. T., BOURNS A. N.

**Kinetic hydrogen isotope effects in aromatic bromodeprotonation.**

Can. J. Chem. 44, 379 (1966)

Direct exchange of protons for prepn. of sodium p-methoxybenzenesulfonate-o,o'-d<sub>2</sub> was unsuccessful. Alternative method: Anisole + CH<sub>3</sub>COOD → anisole-2,4,6-d<sub>3</sub>, + chlorosulfonic acid.

#### 66-179

CRAWFORD R. J., WOO Ch.

**Ortho participation in the conversion of syn-benzaldoxime esters to nitriles.**

Can. J. Chem. 43, 3178 (1965)

o-Iodo-, o-chloro-, o-methoxybenzaldehyde-d and o-methylthiobenzaldehyde-d by redn. of the corresp. N-methyl benzanilides with LiAlD<sub>4</sub> by the method of Weygand *et al.*

#### 66-180

DI MARI S. J., SUPPLE J. H.,  
RAPOPORT H.

**Mass spectra of naphthoquinones. Vitamin K<sub>1(20)</sub>.**

J. Am. Chem. Soc. 88, 1226 (1966)

2-Methyl-d<sub>3</sub>-1,4-naphthoquinone, 2-methyl-d<sub>3</sub>-3-phytyl-1,4-naphthoquinone, starting with naphthoic acid and redn. with LiAlD<sub>4</sub>. 2-Methyl-3-phytyl-1,4-naphthoquinone-5,6,7,8-d<sub>4</sub> from 2-methylnaphthalene by exchange of ring protons with D<sub>3</sub>PO<sub>4</sub>.BF<sub>3</sub>. 2-Methyl-3-phytyl-α-d<sub>2</sub>-1,4-naphthoquinone.

#### 66-181

ITO Sho, TSUNETSUGU J.,  
KANNO T., SUGIYAMA H.,  
TAKESHITA H.

**Syntheses and reactions of deuterated tropenoids.**

Tetrahedron Letters 1965(41), 3659  
CA 64, 3412f (1966)

Catalytic deuteration of 3,5,7-tribromotropolone over Pd-C with D in D<sub>2</sub>O-dioxane in the presence of NEt<sub>3</sub> → 10% tropolone-3,5,7-d<sub>3</sub>. The corresp. OMe deriv. similarly in the presence of NaOAc instead of NEt<sub>3</sub>, and methylation.

## 66-182

PRYOR W. A., HENDERSON R. W.,  
PATSIGA R. A., CARROLL N.

**Hydrogen secondary isotope effects on the radical polymerization of styrene.**

J. Am. Chem. Soc. **88**, 1199 (1966)

The following substituted styrenes were prepd.:  $\alpha$ -d,  $\beta$ -d<sub>2</sub>, ring-d<sub>5</sub>,  $\alpha$ -t, and trans- $\beta$ -t.

See also: 66-199, Phenols, labeling by exchange in alkaline soln.

1.0.4 — *HETEROCYCLIC COMPOUNDS*

## 66-183

BAK G., CHRISTENSEN C. H.,  
CHRISTENSEN D., HANSEN T. S.  
PEDERSEN E. J., NIELSEN J. T.

**Preparation of 1,3,4-thiadiazole and its (2-D), (2,5-D<sub>2</sub>), (2-<sup>13</sup>C), and (3-<sup>15</sup>N) isotopic species.**

Acta Chem. Scand. **19**, 2434 (1965)

Title compds. were prepared in high purity and sufficient quantities.

## 66-184

KORYTNYK W., PAUL B.

**Pyridoxine chemistry. IX.1. Selectively deuterated pyridoxols and some aspects of N. M. R. spectroscopy of vitamin B<sub>6</sub> compounds. 2.**

J. Heterocyclic Chem. **2**, 481 (1965)  
CA **64**, 8130c (1966)

Pyridoxol- $\alpha^4, \alpha^4$ -d<sub>2</sub>. HCl in 48% yield by acylation of 4-pyridoxic acid lactone with Ac<sub>2</sub>O and treatment of the 3-O-acetyl-4-pyridoxic acid lactone with LiAlD<sub>4</sub>. Pyridoxol- $\alpha^5, \alpha^5$ -d<sub>2</sub> by redn. of Me  $\alpha^4, 3$ -O-isopropylidene-5-pyridoxate with LiAlD<sub>4</sub>, followed by cleavage of  $\alpha^4, 3$ -O-isopropylidene-pyridoxol- $\alpha^5, \alpha^5$ -d<sub>2</sub> with HCl.

1.0.5 — *CARBOHYDRATES*

## 66-185

LEMIEUX R. U., STEVENS J. D.

**The proton magnetic resonance spectra and tautomeric equilibria of aldoses in deuterium oxide.**

Can. J. Chem. **44**, 249 (1966)

6,6'-Dideuterio-1,2:5,6-di-O-isopropylidene- $\alpha$ -D-glucofuranose (I) by redn. of 1,2-O-isopropylidene- $\alpha$ -D-glucofuranurono-6,3-lactone with LiAlD<sub>4</sub>; yield 41.4% based on LiAlD<sub>4</sub>.

2-Deuterio- $\beta$ -D-arabinose (II) from 2-O-benzyl-D-arabinose and D<sub>2</sub>O/NaOD, 25°, 7 days and subsequent hydrogenolysis.

2,5,5'-Trideuterio- $\beta$ -D-arabinose starting from I, then as described for II.

## 66-186

PERLIN A. S.

**Hydroxyl proton magnetic resonance in relation to ring size, substituent groups, and mutarotation of carbohydrates.**

Can. J. Chem. **44**, 539 (1966)

1,2-O-Isopropylidene- $\beta$ -D-arabinofuranose-5,5'-d<sub>2</sub> (I) by redn. of the corresp. uronic acid methyl ester with B<sub>2</sub>D<sub>6</sub>. Hydrolysis of I  $\rightarrow$  D-arabinose-5,5'-d<sub>2</sub>.

1.0.6 — *PEPTIDES, AMINO ACIDS, PROTEINS*

## 66-187

BLOMQUIST A. T., HISCOCK B. F.,  
HARPP D. N.

**Deuterated amino acids. I. The synthesis of glycine-d<sub>5</sub> and related derivatives.**

J. Org. Chem. **31**, 338 (1966)

Diethyl acetamidomalonate heating in DCl-D<sub>2</sub>O (from thionyl chloride and D<sub>2</sub>O)  $\rightarrow$  glycine-d<sub>5</sub> deuteriochloride in 97% yield;  $\rightarrow$  glycine-d<sub>5</sub> (I) (97.1% isotopic purity) by treatment with triethylamine. Recrystallization of I from water  $\rightarrow$  glycine-d<sub>2</sub> with >99% deuteration on the  $\alpha$ -carbon atom.

## 66-188

CALF G. E., GARNETT J. L.,  
HALPERN B. H., TURNBULL K.

**Stereospecific catalytic labeling of amino acids and mandelic acid with isotopic hydrogen.**

Nature **209**, 502 (1966)

L(+)-Alanine (I) L(-)-phenylalanine (II) and mandelic acid (III), exchange with D<sub>2</sub>O in the presence of hydrogen pre-reduced Pt. Labeling of II at 30° with retention of configuration, mainly in the phenyl group, at 130° labeling with inversion, with I only labeling at 130° with inversion.

1.0.7 — *STEROIDS*

66-189

DJERASSI C., TÖKES L.

**Mass spectrometry in structural and stereochemical problems. XCIII. Further observations on the importance of interatomic distance in the McLafferty rearrangement. Synthesis and fragmentation behavior of deuterium-labeled 12-keto steroids.**

J. Am. Chem. Soc. **88**, 536 (1966)

20,20-d<sub>2</sub>-5 $\alpha$ -Pregnan-12-one by redn. of the 20-tosylhydrazone of the 12 $\beta$ -aceto-20-ketone with NaBD<sub>4</sub> and reoxidation of the 12-hydroxyl group. Monodeuteration at C-20 from : 5 $\alpha$ -pregnan-12,20-dione, ketalization at C-12, LiAlD<sub>4</sub> redn., -H<sub>2</sub>O, hydrogenation  $\rightarrow$  5 $\alpha$ -pregnan-12-one-20-d<sub>1</sub>. 5 $\alpha$ -Pregnan-12-one, + SeO<sub>2</sub>  $\rightarrow$   $\Delta^9(11)$ -5 $\alpha$ -pregnan-12-one (I), catal. deuteration and back exchange with OH<sup>-</sup>  $\rightarrow$  9 $\alpha$ -d<sub>1</sub>-5 $\alpha$ -pregnan-12-one; base catalyzed exchange of I in MeOD, catal. hydrogenation and back exchange with OH<sup>-</sup>  $\rightarrow$  8 $\beta$ -d<sub>1</sub>-5 $\alpha$ -pregnan-12-one.

66-190

KARLINER J., BUDZIKIEWICZ H., DJERASSI C.

**Mass spectrometry in structural and stereochemical problems. XCI. The electron impact induced elimination of water from 3-hydroxy steroids.**

J. Org. Chem. **31**, 710 (1966)

5 $\alpha$ -Cholestan-3 $\beta$ -ol, labeled with D in positions :

3 $\alpha$ ; 2,2,4,4; 1 $\alpha$ ; 5 $\alpha$ ; 1,1.

5 $\alpha$ -Cholestan-3 $\alpha$ -ol-1 $\alpha$ -d<sub>1</sub>; -5 $\alpha$ -d<sub>1</sub>; -1,1,3 $\beta$ -d<sub>3</sub>. 5 $\alpha$ -Cholestan-2 $\beta$ -ol-1,1,3,3-d<sub>4</sub>;  $\Delta^2$ -5 $\alpha$ -cholestene-1,1,3-d<sub>3</sub>.

**1.1 — Tritium compounds**

1.1.1 — *GENERAL*

66-191

AVDONINA E. N.,  
BARANOVSKII I. B.,  
WUNG Hao-ming,  
NESMEYANOV An. N.

**Reactions of tritium recoil atoms and <sup>14</sup>C with heterocyclic amines.**

Radiokhimiya, **7**, 220 (1965)

N. S. A. **20**, 1921 (1966)

Radiation stability and radiochemical yields of pyridine and picoline are increased with increase of the possibility of energy dispersion in the system. In the presence of nickel compounds the introduction of tritium into the organic molecule increases because of the abrupt intensification of the isotope exchange with HT under exposure conditions.

66-192

CRAWFORD B. R., GARNETT J. L.

**Wilzbach tritiation studies. II. Stereospecificity in the tritiation of alcohols.**

Aust. J. Chem. **18**, 1951 (1965)

Phthalic acid oct-2-yl monoester, resolved in its (+)- and (-)-form were labeled with T by gas exposure predominantly under retention of configuration, whereas the free alcohol racemizes to the extent of 80%.

66-193

ODELL A. L., PACKER J. E.,  
WHITE G. R.

**Labeled products from the internal radiolysis**

of liquid cyclohexane saturated with tritium gas.

Nature **209**, 72 (1966)  
CA **64**, 6441b (1966)

No compds. other than the parent cyclohexane were detected with a  $^{90}\text{Sr}$ - $\beta$ -ionization mass detector, but numerous labeled products were identified with the radiation detectors.

### 1.1.2 — ALIPHATIC COMPOUNDS

66-194

ARIGONI D., LYNEN F., RETEY J.

**Stereochemie der enzymatischen Carboxylierung von (2R)-2- $^3\text{H}$ -Propionyl-Coenzym A.**

Helv. Chim. Acta **49**, 311 (1966)  
Diacetyl +  $\text{LiAl}^3\text{H}_4$ , periodate cleavage  $\rightarrow$  acetaldehyde-1- $^3\text{H}$ , + germ-ADH + NADH, + tosyl chloride  $\rightarrow$  ethyl tosylate ( $6.6 \times 10^6$  ipm/mmole), + KCN, sapon.  $\rightarrow$  (R)-2- $^3\text{H}$ -propionic acid ( $6.24 \times 10^6$  ipm/mmole), transformation to the title compd.

66-195

KOEBRICH G., FROEHLICH H.

**Zum Chemismus der Thermolyse von Salzen der  $\alpha$ -Chlor-zimtsäure.**

Ann. Chemie **691**, 68 (1966)  
 $\text{PhLi} + ^{14}\text{CH}_2\text{O} \rightarrow$  benzylalcohol (I)  $\rightarrow$  benzaldehyde, + ethoxy-carbonyl-chloromethylene-triphenylphosphorane  $\rightarrow$  trans-2-chloro-3-phenyl-acrylic acid-3- $^{14}\text{C}$ , yield 23% from I, sp. act. 117  $\mu\text{Ci/mole}$ .

66-196

NISHIZAWA Y., CASIDA J. E.

**Synthesis of d-trans-chrysanthemumic acid-1- $^{14}\text{C}$  and its antipode on a semimicro scale.**

J. Agr. Food Chem. **13**, 525 (1965)  
CA **64**, 3608d (1966)

dl-trans-Chrysanthemumic acid-1- $^{14}\text{C}$  in

45% yield from 4 mmoles of ethyl glycinate-1- $^{14}\text{C}$  (I). Geometrical isomers were sep'd. by column chrom. and optical isomers of the trans-acid were resolved as an 1- $\alpha$ -methylbenzylamine salt for the d-isomer. Overall yield based on I (2.7 mCi/mmole), 7.0% pure d-isomer (sp. act. 1.3 to 2.7 mCi/mmole).

66-197

THOMAS R. C., IKEDA G. J.

**Preparation of tritium-labeled compounds. I. Series of sulfonylurea hypoglycemic agents by exchange with tritium gas.**

J. Pharm. Sci. **55**, 112 (1966)  
CA **64**, 6490e (1966)

Sodium salts of the sulfonylureas were found to incorporate stably bound tritium more effectively than did the corresponding free compds. Exposure to tritium gas in the presence of an electrical discharge was also found to be an effective method for prepg. tritium-labeled sulfonylureas.

### 1.1.3 — AROMATIC COMPOUNDS

66-198

BOHLMANN F., von KAP-HERR W.

**Polyacetylenverbindungen, XCII. Zur Biogenese des Carlinaoxyds.**

Chem. Ber. **99**, 148 (1966).

Benzoic acid- $^3\text{H} \rightarrow$  phenylacetylene ( $2.6 \times 10^8$  ipm/mmole) + tetrahydropyranyl ether of cis-bromopentenynol, subsequent hydrolysis  $\rightarrow$  60% cis-1-(phenyl- $^3\text{H}$ )-hepta-5-en-1,3-diyne-7-ol ( $2.6 \times 10^8$  ipm/mmole).

66-199

KIRBY G. W., OGUNKOYA L.

**Deuterium and tritium exchange reactions of phenols and the synthesis of labeled 3,4-dihydroxyphenylalanines.**

J. Chem. Soc. **1965**, 6914

Preparative procedures are outlined for the labeling of phenols with deuterium and tritium by exchange in alkaline solution.

Illustration by the synthesis of ( $\pm$ )-3,4-dihydroxyphenylalanine labeled spec. at each of the nuclear and side-chain positions.

### 1.1.4 — *HETEROCYCLIC COMPOUNDS*

66-200

ARGOUDELIS C. J.,  
KUMMEROW F. A.

**Synthesis of pyridoxine labeled with tritium at specific positions.**

Biochemistry **5**, 1 (1966)

Pyridoxine labeled with T at the 4- or 5-hydroxymethyl group by reducing the corresp. 4- or 5-pyridoxic acid lactone with tritiated  $\text{LiAlH}_4$ , yield 70-74% based on the lactones and 20-21% based on the radioactivity. Degradn. on the former showed that more than 96% of the radioactivity was at the 4-hydroxymethyl group.

66-201

BARZ W., GRISEBACH H.

**Über die Bedeutung von 3,5,7,4'-Tetrahydroxyflavanon (Dihydrokaempferol) für die Biosynthese von Isoflavonon.**

Z. Naturforschg. **21b**, 47 (1966)

T-labeling of dihydrokaempferol (I) by a modified Wilzbach method on quartz powder, sp. act. 11.7 mCi/mmole. Dehydrogenation of labeled I with sodium bisulfite to Kaempferol, sp. act. 6.84 mCi/mmole.

66-202

SCHNEIDER W. C., FISCUS W. G.,  
LAWLER Jo Ann B.

**Enzymic preparation of labeled phosphoryl choline, phosphoryl ethanolamine, cytidine diphosphate choline, deoxycytidine diphosphate choline, cytidine diphosphate ethanolamine, and deoxycytidine diphosphate ethanolamine.**

Anal. Biochem. **14**, 121 (1966)

Title compds. labeled with either  $^{14}\text{C}$  (in the aliph. moiety) or  $^3\text{H}$  (in the hetero-

cyclic moiety), in yields ranging from 50 to 97%, by incubating CTP or dCTP with P-choline or P-ethanolamine with crude preparations obtained from rat liver, or by incubating choline or ethanolamine with ATP and similar rat liver preparations.

See also: 66-205, Actinomycins- $^3\text{H}$  of high sp. act.

### 1.1.5 — *CARBOHYDRATES*

66-203

BICHUL T. V.,  
POCHIKOVSKAYA V. M.,  
SAPOZHNIKOVA E. P.,  
KOLOSOV M. A., KOZLOVA L. P.

**D-Ribose.**

U.S.S.R. **172. 741**. July 7, 1965, Appl. March 31, 1964.

CA **64**, 2152h (1966)

Redn. of D-ribono-1,4-lactone with  $\text{NaBH}_4$ - $^3\text{H}$ , isolation as the complex of N-phenyl- $\alpha$ -D-ribofuranosylamine-1- $^3\text{H}$ .

66-204

WARTBURG A. v., KALBERER F.,  
RUTSCHMANN J.

**Tritium-labeled cardiac glycosides. Digoxin-(12 $\alpha$ -t).**

Biochem. Pharmacol. **14**, 1883 (1965)  
CA **64**, 6739a (1966)

The partial synthesis of digoxin-(12 $\alpha$ -t) with a sp. act. 50 mCi/mmole is described.

### 1.1.6 — *PEPTIDES, AMINO ACIDS, PROTEINS*

66-205

KATZ E., MAUGFR A. B.,  
WEISSBACH H.

**Biosynthesis of highly labeled actinomycins.**  
Mol. Pharmacol. **1** 107 (1965)

CA **64**, 5707e (1966)



Actinomycins (80,000 cpm/ $\gamma$ ) by *Streptomyces antibioticus* during growth with L-methionine-(methyl- $^3\text{H}$ ).

**66-206**

SIMONOV E. F.,  
NESMEYANOV An. N.

**Radiation protection of amino acids during a reaction with tritium recoil products.**

Vestn. Mosk. Univ. Ser. II, Khim. **20** (5), 28 (1965)

CA **64**, 5410a (1966)

The chem. transformations of L-glutamic acid (I), DL-methionine, and L-cysteine in the presence of  $\text{Li}_2\text{CO}_3$  under the action of slow neutrons were studied.

The main decompn. products of I were glutaric,  $\alpha$ - and  $\gamma$ -aminobutyric, and pyrrolidinonecarboxylic acids, and serine. When the system contained 35%  $\text{Li}_2\text{CO}_3$ , the max. amt. of I remained chem. unchanged.

See also: **66-264**, Amino acids- $^3\text{H}$

**1.1.7 — STEROIDS****66-207**

BJOERKHEM I., DANIELSSON H.,  
ISSIDORIDES C., KALLNER A.

**On the synthesis and metabolism of cholest-4-en-7 $\alpha$ -ol-3-one. Bile acids and steroids 156.**

Acta Chem. Scand. **19**, 2151 (1965)

Electrolytic coupling of chenodeoxycholic acid, labeled by exposure for 4 weeks to 2 Ci of T gas, with isovaleric acid  $\rightarrow$  5 $\beta$ -cholestane-3 $\alpha$ ,7 $\alpha$ -diol (sp. act. 30  $\mu\text{Ci}/\text{mg}$ ), oxidn. with Al-tert-butoxide  $\rightarrow$  5 $\beta$ -cholestan-7 $\alpha$ -ol-3-one (sp. act. 23  $\mu\text{Ci}/\text{mg}$ ), +  $\text{SeO}_2$   $\rightarrow$  title compd. (sp. act. 11  $\mu\text{Ci}/\text{mg}$ ).

**66-208**

BRODIE H. J., BABA S., GUT M.,  
HAYANO M.

The catalytic reduction of 3 $\beta$ -hydroxyandrost-5-en-17-one with tritium. The distribution and orientation of label in the product.

Steroids **6**, 659 (1965)

CA **64**, 5161f (1966)

Redn. with carrier-free tritium  $\rightarrow$  mainly 3 $\beta$ -hydroxy-5 $\alpha$ -androstan-17-one (I)  $\rightarrow$  androst-4-one-3,17-dione (II) with a loss of 43% of the label. 6 $\beta$ -Bromination and 6 $\beta$ -methoxylation on II with little loss of label, indicating the tritium at C-6 to be  $\alpha$ -orientated. The distribution of tritium in I was 43% 5 $\alpha$ , 35% 6 $\alpha$  and 22% 7 $\alpha$ .

**66-209**

EDWARDS B. E., RAO P. N.

**Synthesis of (1 $\beta$ - $^3\text{H}$ )testosterone.**

Biochim. Biophys. Acta **115**, 518 (1966)

Catal. redn. of 17 $\beta$ -hydroxyandrost-1,4-dien-3-one with  $^3\text{H}_2$   $\rightarrow$  testosterone-1,2- $^3\text{H}$ ,  $\rightarrow$  stereosp. redn. with Li/THF-NH $_3$ , equilibration in methanolic KOH (labile T at C-2) and oxidn. with chromic acid  $\rightarrow$  5 $\alpha$ -androstan-3,17-dione-1 $\beta$ - $^3\text{H}$ , incubn. with enzym extract from *B. sphaericus* ( $\Delta^{1,2}$ ) redn. with  $\text{LiAlH}_4$ , oxidn. with DDO, +  $(\text{Ac})_2\text{O}$   $\rightarrow$  17 $\beta$ -acetoxy-5 $\alpha$ -androst-1-en-3-one-1- $^3\text{H}$ , hydrogenation, and transformation to the title compd. by known methods (sp. act. 30  $\mu\text{Ci}/\text{mg}$ ). Proof of the site of the label.

**66-210**

FISHMAN J.

**Stereochemistry of enolization of 17-keto steroids.**

J. Org. Chem. **31**, 520 (1966)

16 $\beta$ - $^3\text{H}$ -17 $\alpha$ -Estradiol benzoate ( $3.10 \times 10^6$  cpm/mg), 16 $\beta$ - $^3\text{H}$ -estrone benzoate, 16 $\alpha$ - $^3\text{H}$ -17 $\beta$ -estradiol 3-benzoate ( $5.42 \times 10^6$  cpm/mg), and 16 $\alpha$ - $^3\text{H}$ -estrone benzoate were prepd. by the reaction sequence described in J. A. C. S. **87**, 3455 (see abstr. **65-429**).

**66-211**

KLEIN P. D., ERENICH E. H.

**Tritiated alumina as a reagent for self-labeling chromatographic analyses.**

Anal. Chem. **38**, 480 (1966)

Tritiated alumina by exchange of the surface hydroxyl groups with tritiated water,

excellent reproducibility and stoichiometry. Model compounds show incorporation of activity proportionate to sample size over a range from 3  $\mu$ g. to 10 mg.; tritium incorporation also shows a good correlation with the structural features and the number of enolic hydrogens. Radiochemical visualization and separation of a mixture of three ketosteroids by a chromatographic column of tritiated alumina is presented as an illustration.

**66-212**

OKUDA K., DANIELSSON H.

**Synthesis and metabolism of 5 $\beta$ -cholestane-3 $\alpha$ ,7 $\alpha$ ,12 $\alpha$ -TRIOL-26-al. Bile acids and steroids 161.**

Acta Chem. Scand. **19**, 2160 (1965)

Cholic acid of a sp. act. of 20  $\mu$ Ci lab. with T gas, 2 Ci, by exposure for 4 weeks,  $\rightarrow$  corresp. aldehyde, + ( $\alpha$ -carbethoxy-ethylidene)-triphenyl-phosphorane  $\rightarrow$  3 $\alpha$ ,7 $\alpha$ ,12 $\alpha$ -trihydroxy-5 $\beta$ -cholest-24-en-26-oic acid, Grundmann synthesis (28-homo-5 $\beta$ -cholestane-3 $\alpha$ , 7 $\alpha$ , 12 $\alpha$ , 27, 28-pentol)  $\rightarrow$  5 $\beta$ -cholestane-3 $\alpha$ , 7 $\alpha$ , 12 $\alpha$ -triol-26-al (sp. act. 15  $\mu$ Ci/mg over-all yield 5%).

See also: **66-204**, Digoxin-<sup>3</sup>H

**66-247**, 3 $\alpha$ - and 3 $\beta$ -<sup>3</sup>H-4-<sup>14</sup>C-  
Cholest-4-ene-3 $\alpha$ , 7 $\alpha$ ,  
12 $\alpha$ -triol

**1.2 — Carbon-14 compounds****1.2.1 — GENERAL****66-213**

BARAKAT M. F., FIRSOVA L. P., NESMEYANOV An. N.

**Reaction of <sup>14</sup>C recoil atoms in mixtures containing  $\alpha$ -picoline.**

Radiokhimiya, **7**, 361 (1965)N. S. A. **20**, 7167 (1966)**66-214**

CACACE F., WOLF A. P.

**Reactions of energetic carbon atoms with ammonia. II.**J. Am. Chem. Soc., **87**, 5301 (1965)

Carbon atoms react with gaseous ammonia to give methane, methylamine, and methylenimine.

**66-215**

DZANTIEV B. G., SHEVCHENKO A. P.

**Formation of polymers labeled with <sup>14</sup>C during ethylene-ammonia irradiated in nuclear reactor.**

Radiokhimiya, **7**, 368 (1965)N. S. A. **20**, 1922 (1966)

Small additions (2 to 5%) of ethylene and ammonia lead to an abrupt increase of the fraction of recoil <sup>14</sup>C held in the form of labeled polymers.

See also: **66-191**, Recoil reaction of pyridine and picoline with C-14.

**1.2.2 — ALIPHATIC COMPOUNDS****66-216**

BOUTHILLIER L. P., PUSHPATHADAM J. J., BINETTE Y.

**Study of the metabolism of 2-hydroxy-4-aminobutyric acid, a product of  $\gamma$ -hydroxyglutamic acid decarboxylation.**

Can. J. Biochem. **44**, 171 (1966)

DL-2-Hydroxy-4-aminobutyric-4-<sup>14</sup>C acid (I) from K<sup>14</sup>CN (1 mCi) + ethyl 3-bromopropionate, hydrogenation in (Ac)<sub>2</sub>O and subseqn. hydrolysis  $\rightarrow$  4-aminobutyric acid, + N-carbethoxy phthalimide, bromination in 2-pos., hydrolysis first with CaCO<sub>3</sub> and then with HCl  $\rightarrow$  I, over-all yield of 23%, sp. act.  $1.9 \times 10^5$  cpm/mg.

**66-217**

DOBBS H. E.

**The preparation of carbon-14 labeled chloroform and methylene chloride.**

Atompraxis **12**, 83 (1966)

Chloroform- $^{14}\text{C}$  (sp. act. 2.3 mCi/mole) from acetone-1,3- $^{14}\text{C}$  and calcium hypochlorite. A refluxing solution of chloroform in dioxan is reduced to methylene chloride by addition of  $\text{LiAlH}_4$  in dioxan. The active methylene chloride is removed from the system by distillation, yield 70%.

**66-218**

EL-MERZABANI M.M.

**Synthesis of 3,3'-bis(mesyloxy)-N-methyl- $^{14}\text{C}$ -dipropylamine hydrochloride.**

Chem. Pharm. Bull. (Tokyo) **13**, 1362 (1965)

CA **64**, 4926e (1966)

Addn. of  $^{14}\text{CH}_3\text{-NH}_2 \cdot \text{HCl}$  to Et-acrylate, redn. with  $\text{LiAlH}_4$ , +  $(\text{MeSO}_2)_2\text{O} \rightarrow$  title compd., sp. act.  $1.8 \times 10^4$  cpm/mg.

**66-219**

LEE C. C., FORMAN A. G.

**Rearrangement studies with  $^{14}\text{C}$ . XXIV. Solvolyses of 2-( $\alpha$ -naphthyl)-1- $^{14}\text{C}$ -ethyl p-toluenesulfonate.**

Can. J. Chem. **43**, 3387 (1965)

Carbonation of the Grignard reagent with  $^{14}\text{C}$ -carbon dioxide  $\rightarrow$   $\alpha$ -naphthyl-1- $^{14}\text{C}$ -acetic acid, +  $\text{LiAlH}_4$ ,  $\rightarrow$  2-( $\alpha$ -naphthyl)-1- $^{14}\text{C}$ -ethanol,  $\rightarrow$  title compd.

**66-220**

MERRILL E. J.

**Solubility of pentaerythritol-1,2- $^{14}\text{C}$  tetranitrate in water and saline.**

J. Pharm. Sci. **54**, 1670 (1965)

CA **64**, 1901g (1966)

Acetaldehyde-1,2- $^{14}\text{C}$ ,  $\rightarrow$  tetraacetate by Wiersma's method (W., et al., CA **58**, 6169 d),  $\rightarrow$  tetranitrate by Berlow's method (B., et al., The Pentaerythritols, New York: Reinhold Pub. Corp., 1958, 317 pp.).

**66-221**

SCHUCHING S. L. von, FRYE G. H.

**A new derivative of vitamin C and its application to the synthesis of labeled ascorbic acid.**

Biochem. J. **98**, 652 (1966)

Preparation of a mono-O-cyclohexylidene derivative of L-ascorbic acid shielding C-5 and C-6 of the ascorbic acid molecule. The double bond of the new derivative is more resistant to oxidation than its parent compound. Ascorbic acid is easily regenerated by mild acid hydrolysis. The new derivative facilitates the synthesis of  $^{14}\text{C}$ -labeled vitamin C.

**66-222**

WARD P. F. V., HUSKISSON N. S.

**Small scale preparation of (1- $^{14}\text{C}$ )fluoroacetic acid.**

Biochim. Biophys. Acta **115**, 515 (1966)

(1- $^{14}\text{C}$ )Chloroacetic acid (6.9 mg; 0.5 mCi) + diazomethane, addn. to KF in molten acetamide.

Final purifn. by GLC. Yield: 60%, sp. act. 0.42 mCi/mmole. Description of the app.

### 1.2.3 — AROMATIC COMPOUNDS

**66-223**

BADGER G. M., JOLAD S. D., SPOTSWOOD T. M.

**The formation of aromatic hydrocarbons at high temperatures. XXV. The pyrolysis of (3- $^{14}\text{C}$ )indene.**

Aust. J. Chem. **19**, 85 (1966)

Grignard reagent of  $\beta$ -phenylethylbromide +  $^{14}\text{CO}_2$ , Friedel-Crafts reaction, redn. to the carbinol,  $-\text{H}_2\text{O} \rightarrow$  title compd.

**66-224**

BADGER G. M., JOLAD S. D., SPOTSWOOD T. M.

**The formation of aromatic hydrocarbons at high temperatures. XXVI. Pyrolysis of (1- $^{14}\text{C}$ )styrene.**

Aust. J. Chem. **19**, 95 (1966)

Friedel-Crafts reaction between benzene and (1- $^{14}\text{C}$ )-sodium acetate, redn. to 1-phenyl-ethanol-1- $^{14}\text{C}$ , + HCl concd.  $\rightarrow$

1-chloro-1-phenylethane,  $-HCl \rightarrow$  title compd.

66-225

BUTOMO S. V., REIKHSFEL'D V. O., MAKOVETSKII K. L.

**Synthesis of trimethylbenzenes for measuring natural radiocarbon by means of scintillation method.**

Radiokhimiya, 7, 364 (1965).

N. S. A. 20, 2062 (1966)

Mesitylene and pseudocumene by the scheme  $C \rightarrow CaC_2 \rightarrow Mg_2C_3 \rightarrow CH_3-C \equiv CH \rightarrow C_6H_3(CH_3)_3$  with a total carbon yield of 50%.

66-226

FISCHER E., HAFFERL W., SCHMIDL M.

**Synthesis of  $^{14}C$ -labeled terphenyls.**

EUR 2527.d (1965)

o-Terphenyl, and p-terphenyl either  $U-^{14}C$  or  $1-^{14}C$  labeled by reaction of aryl lithium compounds with cyclic ketons, yield (on the 10 to 25 mmole scale) between 40 and 60%, referred to radioactive starting material, sp. act. up to 0.25 mCi/mmole.

66-227

GRIFFITHS M. H., MOSS J. A., ROSE J. A., HATHWAY D. E.

**The comparative metabolism of 2,6-dichlorothiobenzamide (Prefix) and 2,6-dichlorobenzonitrile in the dog and rat.**

Biochem. J. 98, 770 (1966)

2,6-Dichlorobenzo( $^{14}C$ )nitrile (I) from 2,6-dichloriodobenzene +  $Cu^{14}CN$ ; sp. act.  $9.1 \mu Ci/mg$ .  $I + H_2S \rightarrow$  2,6-dichlorothiobenz( $^{14}C$ )amide; sp. act. :  $3.2 \mu Ci/mg$ .

66-228

HAGOPIAN M.

**Synthesis and metabolism of dopamine- $^{14}C$ .**

Thesis (Clark Univ., Worcester, Mass.)

Order No. 65-10,401; Dissertation Abstr. 26(4), 1894 (1965)

3,4-Dimethoxybenzaldehyde, catal. hydrogeneration  $\rightarrow$  corresp. alcohol, +  $SOCl_2 \rightarrow$

corresp. chloride, +  $K^{14}CN + LiAlH_4/AICl_3 \rightarrow$  3,4-dimethoxyphenethylamine- $^{14}C$ , demethylation (HI), purifn. as its O,O,N-triacetyl deriv. hydrolysis  $\rightarrow$  dop amine $^{14}C$ .

66-229

KUWATSUKA Sh., CASIDA J. E.

**Synthesis of methylene- $^{14}C$ -dioxyphenyl compounds. Radioactive safrole, dihydrosafrole, myristicin, piperonyl butoxide and diastereoisomers of sulfoxide.**

J. Agr. Food Chem. 13, 528 (1965)

CA 64, 3391g (1966)

Methylene- $^{14}C$  iodide, prepd. by redn. of iodoform- $^{14}C +$  appropriate catechol  $\rightarrow$  following methylene- $^{14}C$ -dioxyphenyl compounds with a sp. act. of 1.0 mCi/mmole : safrole, dihydrosafrole, myristicin, sulf-oxide synergist (1,2-methylenedioxy-4-(2-(octylsulfinyl)propyl)benzene, and piperonyl butoxide( $\alpha$ -(2-(2-butoxyethoxy)ethoxy)-4,5-methylenedioxy-2-propyltoluene).

Yields from iodoform- $^{14}C$  were 31 to 55% on a 0.5-0.8-mmole scale.

66-230

McDOWELL L. L., RYAN M. E.

**Laboratory production of diborane and activation of silica-alumina catalyst for conversion of  $^{14}C_2H_2$  to  $^{14}C_6H_6$  : radiocarbon dating by liquid scintillation spectrometry.**

Intern. J. Appl. Radiation Isotopes 17, 175 (1966)

Diborane from  $NaBH_4$ -boron trifluoride etherate to column containing about 300 g of silica-alumina. Each column will yield about 5 g of  $^{14}C_6H_6$ .

66-231

PACKTER N. M.

**Studies on the biosynthesis of phenols in fungi.**

**Conversion of ( $^{14}C$ )orsellinic acid and ( $^{14}C$ )orcinol into fumigatol by *Aspergillus fumigatus* I.M.I. 89353.**

Biochem. J. 98, 353 (1966)

( $^{14}C$ )Orsellinic acid was prepared biosyn-

thetically from Na(1-<sup>14</sup>C)acetate in a culture medium of *P. barnense*.

Isolation after 7 days.

Sp. act. 4030 cpm/ $\mu$ mole.

#### 66-232

SCHWEER K.-H.

**Die Synthese von 1-(p-Hydroxy-phenyl)-2-amino-äthanol-1-(1-<sup>14</sup>C)-hydrochlorid.**

Atompraxis 12, 85 (1966)

p-Bromophenyl benzyloether  $\rightarrow$  p-benzyloxybenzoic acid-(carbonyl-<sup>14</sup>C), + SOCl<sub>2</sub>, + Cd(CH<sub>3</sub>)<sub>2</sub>  $\rightarrow$  p-benzyloxy-acetophenone- $\alpha$ -<sup>14</sup>C (I), bromination, aminolysis with phthalimide-K, hydrolysis (II) and hydrogenation  $\rightarrow$  title compd., sp. act. 166  $\mu$ Ci/mmole. Yield from I to II, 31%, and in the last step 73%.

#### 66-233

SHAFFER J., BARONOWSKY P., LAURSEN R., FINN F., WESTHEIMER F. H.

**Products from the photolysis of diazoacetyl chymotrypsin.**

J. Biol. Chem. 241, 421 (1966)

Phosgene-<sup>14</sup>C (1.0 mCi; 50 mg) + 80 mg of anhydrous sodium p-nitrophenylate, dilution with 222 mg of unlabeled p-nitrophenyl chloroformate  $\rightarrow$  214 mg with about 0.47 mCi of <sup>14</sup>C per mmole, + CH<sub>2</sub>N<sub>2</sub>  $\rightarrow$  p-nitrophenyl diazo acetate-<sup>14</sup>C.

### 1.2.4 — HETEROCYCLIC COMPOUNDS

#### 66-234

ACKER T. E., BRENNEISEN P. E., TANENBAUM S. W.

**Isolation, structure, and radiochemical synthesis of 3,6-dimethyl-4-hydroxy-2-pyrone.**

J. Am. Chem. Soc. 88, 834 (1966)

Condensation of acetoacetate and methylmalonic acid  $\rightarrow$  5-carbomethoxy-3,6-dimethyl-4-hydroxy-2-pyrone, hydrolysis, -CO<sub>2</sub>  $\rightarrow$

title compd. (I). Starting from malonic ester-2-<sup>14</sup>C (1 mCi/mmole) and after subsequent addns. of carrier there was obtained 5.4 mmoles of I-3-<sup>14</sup>C (sp. act. 23.4  $\mu$ Ci/mmole).

#### 66-235

BUTLER T. C., DAVIDSON J. D.

**Synthesis of 5,5-dimethyl-2,4-oxazolidinedione-2-<sup>14</sup>C.**

J. Pharm. Sci 52, 1110 (1963)

CA 64, 2079c (1966)

Condensation of urea-<sup>14</sup>C with butyl 2-methylactate in the presence of sodium butylate in butanol.

#### 66-236

KING L. J., PARKE D. V., WILLIAMS R. T.

**The metabolism of (2-<sup>14</sup>C)indole in the rat.**

Biochem. J. 98, 266 (1966)

(<sup>14</sup>C)-Formic acid (0.73 g., 0.57 mCi) + o-toluidine  $\rightarrow$  N(<sup>14</sup>C)-formyl-o-toluidine, (1.57 g., 0.67 mCi), addn. to K-t-butoxide, pyrolysis (360°)  $\rightarrow$  (2-<sup>14</sup>C)indole (0.174 g., 97  $\mu$ Ci, equivalent to 19.4% of the theor. radiochem. yield).

#### 66-237

NISHIZAWA Y., CASIDA J. E.

**Synthesis of rotenone-6a-<sup>14</sup>C on a semi-micro scale.**

J. Agr. Food Chem. 13, 522 (1965)

CA 64, 3510 f (1966)

2 mmole Methyl bromoacetate-1-<sup>14</sup>C with 3 mmole derritol  $\rightarrow$  6a, 12a-dehydrorotenone-6a-<sup>14</sup>C in approx. 50% yield. NaBH<sub>4</sub> redn. and subsequent Oppenauer oxidn.  $\rightarrow$  rotenone-6a-<sup>14</sup>C. Yields for conversion with material of 2.36 mCi/mmole 7.5%

#### 66-238

SCHENK H.

**Mercapto-thiocarbonyl-isocyanate und ihre Umlagerung zu Mercapto-carbonyl-senfolen.**

Chem. Ber. 99, 1258 (1966)

Phenyl thiocyanate- $^{14}\text{C}$  + 0.0-diethyl dithiophosphate  $\rightarrow$  S-phenyl dithio-( $^{14}\text{C}$ )-carbamide (80%), + oxalyl chloride  $\rightarrow$  S-phenylmercaptothiazoline-4,5-dione-2- $^{14}\text{C}$  (66%).

**66-239**

SHAW E., RAUGH C. M.,  
KRUMDIECK C. L.

**The chemical degradation of folic acid.  
Photolysis of 2,4,7-trihydroxypteridine.**

J. Biol. Chem. **241**, 379 (1966)

Isoxanthopterin-4a- $^{14}\text{C}$  via 2,4,5-triamino-6-hydroxypyrimidine-5- $^{14}\text{C}$  from ethyl cyanoacetate-2- $^{14}\text{C}$  by the method of Bennett (J. A. C. S. **74**, 2420) followed by condensation with ethyl glyoxylate. Ethyl glyoxylate labeled in the carboxyl group from tartaric acid-1,4- $^{14}\text{C}$ , esterification, glycol cleavage with sodium bismuthate; condensation with 2,4,5-triamino-6-hydroxypyrimidine  $\rightarrow$  isoxanthopterin-7- $^{14}\text{C}$ .

See also: **66-202**, Esters of choline- and 2-amino-ethanol-1,2- $^{14}\text{C}$  with cytidine- and deoxycytidine pyrophosphate

**66-229**, Methylene- $^{14}\text{C}$ -dioxyphenyl compounds.

## 1.2.5 — CARBOHYDRATES

**66-240**

BAYLY R. J., TURNER J. C.

**The preparation of 2-deoxy-D-(1- $^{14}\text{C}$ )ribose.**

J. Chem. Soc. (C), **1966**, 704.

Prepn. of the title compd. starting from 1-deoxy-2,4-O-ethylidene-1-iodo-D-erythritol, +  $\text{K}^{14}\text{CN}$ , hydrolysis with dilute HCl and subsequent hydrogenation. Isolation by paper chrom. 18% Radiochemical yield based on  $\text{K}^{14}\text{CN}$ , 99% radiochem. pure.

**66-241**

FRUSH H. L., SNIEGOSKI L. T.,  
HOLT N. B., ISBELL H. S.

**Synthesis of D-glucose-3- $^{14}\text{C}$  and related compounds.**

J. Res. Natl. Bur. Stand. **69** A, 535 (1965)  
 $^{14}\text{C}$ -Labeled cyanide to D-glyceraldehyde, hydrolysis, improved Rosenmund redn.  $\rightarrow$  Kiliani synthesis, D-tetroses-1- $^{14}\text{C}$ , hydrolysis, lactonization, chrom. sepn. of the four D-pentonic-1- $^{14}\text{C}$  acids, redn. of the fraction containing D-arabinono-2- $^{14}\text{C}$ - and D-xylono-2- $^{14}\text{C}$ -lactone to the corresponding sugars, and chrom. sepn. of these, conversion of D-arabinose-2- $^{14}\text{C}$  into D-glucose-3- $^{14}\text{C}$  and D-mannose-3- $^{14}\text{C}$  by a third Kiliani synthesis. Approx. 3 percent of the radioactivity in the form of D-glucose-3- $^{14}\text{C}$  (2800  $\mu\text{Ci}$ ).

**66-242**

LUCCHINI G., PARISI B.,  
COCUCCI S.

**The biosynthesis of U- $^{14}\text{C}$  gibberellic acid and 3,4- $^{14}\text{C}$ -glucose.**

EUR **2539**. i (Feb. 1966)

Glucose-3,4- $^{14}\text{C}$  by using castor bean endosperms and rat liver. In the first case,  $^{14}\text{CO}_2$  has been supplied to the tissues in a closed atmosphere; in the second  $\text{NaH}^{14}\text{CO}_3$  was injected intra peritoneum to adult male rats. Sp. act. 0.035 and 0.057  $\mu\text{Ci}/\mu\text{mole}$  resp.

A new technique for the degradation of labeled glucose has been worked out, based on the use of purified enzyme. Biosynthesis of gibberellic acid of sp. act. of 1.05  $\mu\text{Ci}/\mu\text{mole}$ .

**66-243**

NEJEDLY Z., KOUTECKY Z.,  
GRUENBERGER D.

**Preparation of ribonucleoside 5'-monophosphates- $^{14}\text{C}$  of high specific activity from the algae *Chlorella pyrenoidosa*.**

Coll. Czech. Chem. Commun. **30**, 3361 (1965)

Photosynthesis in  $^{14}\text{CO}_2$  atmosphere, from  $\text{Ba}^{14}\text{CO}_3$  of high isotopic ratio (33 to 47%); enzymatic cleavage of the nucleic acids- $^{14}\text{C}$  with the phosphodiesterase from snake venom; chrom. on Dowex 1  $\times$  2 and on Whatman N $^\circ$  3 paper; sp. act. up to 100 mCi/mmole.

66-244

PATSCHE L., BARZ W.,  
GRISEBACH H.Stereospezifischer Einbau von (-)5.7.4'-  
Trihydroxyflavanon in Flavonoide und Iso-  
flavone.Z. Naturforschg. **21b**, 201 (1966)(±)5,7,4'-Trihydroxyflavanone-5-glucoside  
(-2-<sup>14</sup>C) was synthesized and the diaster-  
eomeric (+) and (-) glucosides were  
separated by paper chromatography.

66-245

PICHAT L., DUFAY P., LAMORRE Y.  
Méthode chimique simple de préparation  
des deux anomères  $\alpha$  et  $\beta$  de la désoxy-2'  
adénosine marqués au <sup>14</sup>C.Bull. Soc. Chim. France **1966**, 177.2 Mmoles of 1-chloro-3,5-di-O-p-toluy-2-  
deoxy-D-ribose + 1 mmole of N<sub>6</sub>-acetyl-  
adenine-8-<sup>14</sup>C → after deacylation, 18%  
of the  $\alpha$ -anomer and 9% of the  $\beta$ -anomer  
of 2'-deoxyadenosine-8-<sup>14</sup>C and 65% of  
adenine-8-<sup>14</sup>C.1.2.6 — AMINO ACIDS,  
PEPTIDES, PROTEINS

66-246

NEUMANN D., SCHROETER H. B.

Syntheses of radioactive labeled compounds.  
XIV. Synthesis of  $\alpha$ -N-methyl-<sup>14</sup>C-ornithine  
(I) and of  $\delta$ -N-methyl-<sup>14</sup>C-ornithine (II)Z. Chem. **5**, 385 (1965)CA **64**, 3675h (1966) $\alpha$ -(p-Tolylsulfonyl)ornithine + <sup>14</sup>CH<sub>3</sub>I  
(2.5 mCi/mmole), sealed tube, + HCl → I  
(1.02 × 10<sup>9</sup> cpm/mmole). $\alpha$ -Benzoylornithine + p-MeC<sub>6</sub>H<sub>4</sub>SO<sub>2</sub>Cl,  
OH<sup>-</sup>, →  $\delta$ -(p-tolylsulfonyl)ornithine, →  
(see above) → II (9.4 × 10<sup>8</sup> cpm/mmole).

## 1.2.7 — STEROIDS

66-247

BJORKHEM I., DANIELSSON H.

On the formation of cholic acid from cholest-  
4-ene-3 $\alpha$ ,7 $\alpha$ ,12 $\alpha$ -triol and cholest-4-ene-3 $\beta$ ,  
7 $\alpha$ ,12 $\alpha$ -triol. Bile acids and steroids **166**.Acta Chem. Scand. **19**, 2298 (1965)3 $\beta$ -<sup>3</sup>H-4-<sup>14</sup>C-Cholest-4-ene-3 $\alpha$ ,7 $\alpha$ ,12 $\alpha$ -triol  
and 3 $\alpha$ -<sup>3</sup>H-4-<sup>14</sup>C-cholest-4-ene-3 $\beta$ ,7 $\alpha$ ,12 $\alpha$ -  
triol starting from cholic acid-4-<sup>14</sup>C.  
Introduction of T label by redn. of cholest-  
4-ene-7 $\alpha$ ,12 $\alpha$ -diol-3-one with NaBT<sub>4</sub> (sp.  
act. 2 $\mu$ Ci/mg).

66-248

DEAN P. D. G., WHITEHOUSE M. W.

The chemical synthesis and biological  
oxidation of 7 $\alpha$ -hydroxy(26-<sup>14</sup>C)cholesterol,  
7-dehydro(26-<sup>14</sup>C)cholesterol and 26-hy-  
droxy(26-<sup>14</sup>C)cholesterol.Biochem. J. **98**, 410 (1966)25-Bromonorcholesterol (from the corres-  
ponding 25-oxo-compd. via the alcohol) + Na<sup>14</sup>CN,  
sapon. → 3 $\beta$ -hydroxycholest-5-en-25-oic  
acid-26-<sup>14</sup>C (30%), + CH<sub>2</sub>N<sub>2</sub>, + LiAlH<sub>4</sub>  
→ 26-hydroxycholesterol-26-<sup>14</sup>C.7 $\alpha$ -Hydroxycholesterol-26-<sup>14</sup>C from lab.  
cholesterol by subsequent treatment with  
benzoyl chloride, t-butyl perbenzoate,  
LiAlH<sub>4</sub>; 12-20% yields.7-Dehydrocholesterol-26-<sup>14</sup>C from cholest-  
erol-26-<sup>14</sup>C benzoate by treatment with  
2,3-dibromo-5,5-dimethyl-hydantoin, yield  
10%.

## 1.3 — Halogen Labeled Compounds

66-249

KATSANOS N. A., VARVOGLIS A. G.

The influence of structure upon the retention  
of <sup>82</sup>Br in some neutron-irradiated organic  
compounds.J. Inorg. Nucl. Chem. **27**, 2445 (1965)N.S.A. **20**, 7149 (1966)

66-250

KATO S., KURATA K.

Application of a new method to synthesis of  
radioactive sodium 3,5-diiodofluorescein-3,5-  
<sup>131</sup>I.

Chem. Pharm. Bull. (Tokyo) **13**, 1252 (1965)  
CA **64**, 6029d (1966)

In this method the produced radioisotope of inert form was converted into the active form by isotopic exchange reaction and was reused for the reaction. The radioactive yield was increased from 43% to 70%.

**66-251**

ABDEL-WAHAB M. F.,  
MEGAHED Y. M.

**Preparation of  $^{131}\text{I}$ -Tyrosines and  $^{131}\text{I}$ -Thyroxine.**

Intern. J. Appl. Radiation Isotopes **17**, 132 (1966).

(1-5)mCi  $\text{K}^{131}\text{I}$  + diluted hydrogen peroxide, ether extract, addn. to tyrosine, or thyroxine. Paper chrom.

**66-252**

VERINGA H. A., KERKHOF M. F.

**Labeling of certain milk proteins with  $^{131}\text{I}$ .**

J. Dairy Res. **32**, 181 (1965)

CA **64**, 3888g (1966)

1 g Casein dissolved in 50 ml. 0.01 M Na tetraborate buffer at pH 9.2 at 4° with a soln. contg. 30 mg.  $^{131}\text{I}$  → 750 mg. of material with a sp. act. of 40 nCi/mg. Starchgel electrophoresis revealed no difference between the iodinated and non-iodinated casein.

**1.4 — Phosphorus-32 Compounds****66-253**

DZANTIEV B. G., KISELEVA N. N.,  
SHISHKOV A. V.

**Development of hot synthesis methods for  $^{35}\text{S}$  labeled biologically active substances. III. Preparation of triethylenimine-thiophosphoramidate with binary labeling with  $^{35}\text{S}$  and  $^{32}\text{P}$ .**

Radiokhimiya **7**, 366 (1965)

N. S. A. **20**, 5586 (1966)

Formation of hot atoms by the  $^{35}\text{Cl}(n,p)^{35}\text{S}$  and  $^{35}\text{Cl}(n,\alpha)^{32}\text{P}$  reactions from  $\text{CCl}_4$ . High S and P activities in short irradiation

periods, not exceeding 15 hours, thus preventing radiolysis of the thio TEP.

**66-254**

PROTSENKO L. D., NEGIEVICH L. A.,  
BOGODIST Yu. I., KUZ'MENKO I. I.,  
SKUL'SKAYA N. Ya.

**N-Benzoyl-N',N'',N'''-diethylenetriamide of phosphoric acid, tagged with  $^{32}\text{P}$ .**

Probl. Organ. Sinteza. Akad. Nauk. SSSR, Otd. Obshch. i Tekhn. Khim. **1965**, 319

CA **64**, 6597c (1966)

Prepn. of the title comp. in 26% yield and sp. act. of 11.56 mCi/g.

**66-255**

VANDERHEIDEN B. S.,  
BOSZORMENYI-NAGY I.

**Preparation of  $^{32}\text{P}$ -labeled nucleotides.**

Anal. Biochem. **13**, 496 (1965)

Rapid isotope equilibrium exchange between  $^{32}\text{P}$ -labeled orthophosphate, ATP, and added nucleotides in human erythrocyte hemolyzates. Varying yields, depending on the nucleotide added. Sp. act. varying from 0.2 to 0.7  $\mu\text{Ci}/\mu\text{mole}$  for the  $\gamma$ -phosphate, and 0.003 to 0.1  $\mu\text{Ci}/\mu\text{mole}$  for the  $\beta$ -phosphate starting with 10  $\mu\text{Ci}$   $^{32}\text{P}_i$ .

**66-256**

ZWAIG N., MILSTEIN C.

**The phosphorylated intermediate in the phosphoglyceromutase reaction.**

Biochem. J. **98**, 360 (1966)

2,3-Di( $^{32}\text{P}$ )phosphoglycerate by an enzymic method from 1 mCi  $^{32}\text{P}$ . Up to 7% conversion. Purifn. by paper electrophoresis.

**1.5 — Sulfur-35 Compounds****66-257**

NAKABAYASHI T., KAWAMURA S.,  
KITAO T., TSURUGI Ji.

**Aralkyl hydrodisulfides. V. The reaction of  $^{35}\text{S}$ -labeled aralkyl hydrodisulfides with triphenylphosphine.**



J. Org. Chem. **31**, 861 (1966)

Benzyl chloride addn. to sodium disulfide-<sup>35</sup>S → 77% dibenzyl disulfide (I). Redn. of I with LiAlH<sub>4</sub> → 84% α-toluenethiol-<sup>35</sup>S. Benzhydryl bromide and thiourea-<sup>35</sup>S, heating for 3 hrs. → 75% α-diphenylmethanethiol-<sup>35</sup>S.

#### 66-258

ORATZ M., BURKS A. L.,  
ROTHSCHILD M. A.

**The determination of free ε-amino groups in proteins.**

Biochim. Biophys. Acta **115**, 88 (1966)

Aniline + sulfuric acid-<sup>35</sup>S (100 mCi) → quantitatively sulfanilic acid-<sup>35</sup>S, diazotization, + KI → Na pipsylate, + PCl<sub>5</sub> → p-iodobenzenesulfonyl chloride-<sup>35</sup>S.

See also: **66-253**, Triethylenethiophosphoramide-<sup>35</sup>S and -<sup>32</sup>P, by recoil reaction.

### 1.6 — Oxygen labeled compounds

See also: **66-263**, Methylketene-<sup>18</sup>O

### 1.7 — Nitrogen-15 Compounds

#### 66-259

CRANE C. W.

**The incorporation of <sup>15</sup>N into egg protein.**

Clin. Chim. Acta **13**, 67 (1966)

Incorporation into egg protein by feeding whole yeast protein and yeast protein hydrolyzate, enriched with <sup>15</sup>N, to laying hens. The av. isotope content of egg white from 4 eggs was sufficient to enable the digestion and absorption of the protein to be followed in one normal subject.

#### 66-260

PUCHKOV V. A., PLINER S. A.,  
KHOKHLOV A. S.

**O-Methylisourea-<sup>15</sup>N<sub>2</sub>.**  
U. S. S. R. **173**, 746.

CA **64**, 1972g (1966)

Urea-<sup>15</sup>N<sub>2</sub> is treated with Me<sub>2</sub>SO<sub>4</sub> with heating to 120°.

See also: **66-183**, 1,3,4-Thiadiazole-3-<sup>15</sup>N

### 1.8 — Miscellaneous

#### 66-261

ANGHILERI L. J., MARQUES R.O.

**Biosynthetic Preparation of <sup>75</sup>Se-Methionine and <sup>75</sup>Se-Cystine.**

NP-15594. C.N.E.A. R.154, Argentina. 1965.

N.S.A. **20**, 3661 (1966).

Addn. of sodium selenite (<sup>75</sup>Se) to Saccharomyces cerevisiae culture free of sulphur compounds, → proteins, hydrolysatn, sepn. by exchange resin.

#### 66-262

CELANDER D. R., CELANDER E.

**Utilization of inorganic radioselenium for biosynthetic labeling of tracer proteins.**

Tex. Rep. Biol. Med., **23**, 589 (1965)

N. S. A. **20**, 5262 (1966)

Plasma samples from animals injected with Na<sub>2</sub><sup>75</sup>SeO<sub>3</sub> were subjected to dialysis at three different pH values, to precipitation with such protein precipitants as tungstic acid, trichloroacetic acid, and lead nitrate in an alkaline medium, and to electrophoresis. The results of all these procedures indicate the firm association of <sup>75</sup>Se with protein. Isolation of urokinase from the urine of <sup>75</sup>Se-treated animals gave a preparation containing about 1 μCi/mg crude enzyme protein.

### 1.9 — Carbon-13 compounds

#### 66-263

BAK B., CHRISTIANSEN J.,  
NIELSEN J. T.

**Preparation of 300-500 mg quantities of isotopic methyl ketenes.**

Acta Chem. Scand. **19**, 2252 (1965)

Methods are described for the prepn. of methyl ketene labeled with C-13 at position

1, and 2-3, with O-18, with D (2-d, 2,3-d, and 3,3,3-d<sub>3</sub>).

See also: **66-183**, 1,3,4-Thiadiazole-2-<sup>13</sup>C

## 2. — RADIODECOMPOSITION, STABILITY, STORAGE

**66-264**

NOUVERTNE W.

**Preparation of <sup>3</sup>H labeled amino acids with high specific activity and studies of the storage time (Thesis).**

Cologne, Univ. 1964.

N. S. A. **20**, 3978 (1966)

<sup>3</sup>H labeling of amino acids by decarboxylation and chain lengthening was studied. Methods of preparation and maximum possible storage times for various compounds are given. (See also 65-166, EUR 1828. d.)

**66-265**

ROCHLIN P.

**Self-decomposition of carbon-14-labeled organic compounds.**

Chem. Rev. **65**, 685 (1965)

CA **64**, 3297c (1966)

A review with 41 references.

## 3 — PURIFICATION, SEPARATION

**66-266**

COPAL N. G. S.

**Control of the radiochemical purity of some organic radiopharmaceuticals labeled with <sup>131</sup>I.**

Intern. J. Appl. Radiation Isotopes **17**, 75 (1966)

The two ion-exchange cellulose papers Whatman paper AE 30 and DE 20\* both in the free-base form have been employed. Ascending chrom. and electrophoresis.

**66-267**

ROGINSKII S. Z., AL'TSHULER O. V.,  
VINOGRADOVA O. M.,  
YANOVSKII M. I.,  
KRIVORUCHKO O. P.

**New variations of the chromatographic production of high-purity gases and vapors.**

Bull. Acad. Sciences USSR (div. chem. sc.) **2**, 204 (1965)

The production of especially pure substances using new variations of gas chromatography — thermal displacement, quasi-displacement, and others — was

described (for example, the synthesis of oxygen compounds, with a close to 100% content of O-18, the synthesis of organic compounds with a close to 100% content of C-14, etc.).

**66-268**

URAKUBO G., KIDO Ya.,  
HASEGAWA A.

**Studies on the quality and test method of radiopharmaceuticals. I. Paper chromatography of preparations labeled with <sup>131</sup>I and <sup>125</sup>I.**

Radioisotopes (Tokyo), **14**, 504 (1965)

N.S.A. **20**, 5515 (1966)

Among the solvents tested, the following were regarded as the most suitable for purity tests: for labeled sodium iodide, ethanol:water:benzene (65:35:1) and methanol:water (75:25); for radioactive triiodothyronine, n-butanol:dioxane (4:1) saturated with 2N ammonium carbonate; and for radioactive sodium o-iodohippurate, n-butanol:ethanol (4:1) saturated with 2N ammonium carbonate.

See also: **66-211**, Ketosteroids-<sup>3</sup>H

## 4 — ANALYSIS

## 4.1 — Determination of activity

66-269

BOYD J. B., MITCHELL H. K.

Measurement of the radioactivity in carbon-14 and tritium-labeled proteins that have been separated by disk electrophoresis.

Anal. Biochem. **14**, 441 (1966).

Counting with scintillation techniques after the water in a gel slice has been replaced with a toluene-based scintillation solution.

66-270

BRASELMANN H.

Microdetermination of sulfate content and of sulfate-<sup>35</sup>S activity of mucopolysaccharides.

Acta Biol. Med. Ger. **15**, 173 (1965).

C.A. **64**, 8625d (1966).

A method is described for detg.  $2\text{-}^{12}\gamma\text{SO}_4^-$  with an error of  $\pm 0.2$ .

The radioactivity of the sample can be detd. after oxidn. of the  $\text{Na}_2\text{S}$  with satd. Br water. At 2000 counts, the relative error of the activity detn. is  $\pm 4\%$ , and self-absorption is  $\sim 3\%$ . Protein S does not interfere.

66-271

CORTI F.

Il dosaggio del tritio (rassegna). Parte I.

ISS-65/8. (1965).

N. S. A. **20**, 3876 (1966).

Some methods used in preparing tritiated samples to be directly measured are reviewed.

110 references are cited.

66-272

DAVIES J. W., COCKING E. C.

Liquid scintillation counting of <sup>14</sup>C and <sup>3</sup>H samples using glass-fibre or filter-paper discs.

Biochim. Biophys. Acta **115**, 511 (1966)

Routine analyses of amino acids, nucleosides and for incorporation studies of amino acids and bicarbonate into proteins by plant tissues.

66-273

MAHIN D. T.

A new way to reduce oxygen quenching in liquid scintillation samples.

Intern. J. Appl. Radiation Isotopes **17**, 185 (1966)

Repeatedly freezing samples in liquid nitrogen is a more effective method of gas displacement than gas bubbling, particularly when volatile compounds are involved.

66-274

TRELSTAD R. L.

Double isotope autoradiography.

Exptl. Cell Res. **39**, 318 (1965)

CA **64**, 5438e (1966)

Two emulsions which differ in their sensitivity to beta-radiation. The top emulsion is sensitive to <sup>3</sup>H beta-particles and insensitive to <sup>14</sup>C. Specificity for <sup>14</sup>C is accomplished by using a celloidin film which sep. the second <sup>14</sup>C-sensitive emulsion from close contact with the section.

66-275

YAMAZAKI M., ISHIHAMA H.,

KASIDA Y.

Tritium measurement with a liquid scintillation counter. The application of the oxygen-flask combustion method to a strong coloured sample.

Intern. J. Appl. Radiation Isotopes **17**, 134 (1966)

## 4.2 — Apparatus

66-276

BAGGIOLINI M., BICKEL M. H.

A new type of incubation apparatus for the determination of metabolically produced <sup>14</sup>CO<sub>2</sub>.

Anal. Biochem. **14**, 290 (1966)

Open system under conditions of slightly

reduced pressure. The vessels for  $^{14}\text{C}$  absorption which are not contained inside the incubation flask are used directly for the measurement of radioactivity in a liquid scintillation counter.

66-277

CONWAY D. W., GRACE A. J.,  
ROGERS J. E.

**Simplification of oxygen-flask combustion procedure for preparation of samples for liquid scintillation counting.**

Anal. Biochem. **14**, 491 (1966).

Nichrome for the combustion baskets.

66-278

CRAMER W. A., HOUTMAN J. P. W.,  
KOCH R. O., PIET G. J.

**Measurement of radioactivity in effluents of a gas chromatograph.**

**The flame ionization detector used as a combustion chamber in combination with specially designed absorbers.**

Intern. J. Appl. Radiation Isotopes **17**, 97 (1966)

The  $\text{CO}_2$  from a gas chromatographic column with a flame ionization detector is trapped in special absorbers which are connected with the detector. Total  $^{14}\text{C}$  activities of  $10^{-11}$  Ci/fraction can be determined with  $\pm 15\%$  accuracy in 1 hr counting time.

66-279

FORYS M., ZLOTOWSKI J.

**A device for precise measurements of  $^{14}\text{C}$  radioactivity in organic compounds.**

Nukleonika, **10**, 427 (1965)

N. S. A. **20**, 5511 (1966)

The construction and operation of a self-quenching G-M counter for measuring radioactivity of  $^{14}\text{C}$  in organic compounds, converted to  $\text{CO}_2$ , is described. The statistical error involved in measuring specific activities of the order of  $5 \times 10^5 \mu\text{Ci/mg}$  was less than 1%.

66-280

MERCER N. J. H.  
HENDERSON J. F.

**Selective elution of scintillation phosphors from chromatography paper following radioactivity measurements.**

Anal. Biochem. **13**, 559 (1965)

66-281

QUAZI A. H.

**Influence of sample volume on weak  $\beta$ -counting efficiency in liquid scintillation counting.**

Naturwissenschaften **52**, 490 (1965)

N. S. A. **20**, 5510 (1966)

The dependence was measured on tritiated toluene,  $^{14}\text{C}$ -toluene, tritiated water, and  $^{35}\text{S}$ -labeled urine. The maximum counting efficiency in all cases was obtained with samples between 7 and 15 ml and was independent of the type of scintillator solution.

66-282

SHARP R. A., ELLIS J. G.

**System design in low background internal gas sample counting of  $^{14}\text{C}$  and tritium.**

Gmelin, AED-CONF-65-158-11.

N. S. A. **20**, 2179 (1966)

From International  $^{14}\text{C}$  and  $^3\text{H}$  Dating Conference, Pullman, Wash.

66-283

WERNER G., WERNER H.,  
BOSQUE P. G., QUEVEDO J. C.

**Eine Methode zur autoradiographischen Darstellung hydrophiler Substanzen in biologischem Material.**

Z. Naturforschg. **21b**, 238 (1966)

A method is described for obtaining autoradiograms from hydrophilic T labeled compounds of low molecular weight in biological materials.

66-284

WHITE R. E., DAVIS H. G.

**Detection of volatile  $^{14}\text{C}$  labeled compounds**

by a modified gas chromatography-ionization chamber technique.

Anal. Chim. Acta **34**, 105 (1966)  
N. S. A. **20**, 3899 (1966)

Compds. are separated by preparative gas chromatography, trapped out as they elute from the column, and then are transferred to a static ionization chamber where entire separated fractions are counted. Advantages of the method are discussed.

#### 4.3 — Determination of radiochemical pattern

66-285

BUTLER K.

**Anisomycin. II. Biosynthesis of anisomycin.**

J. Org. Chem. **31**, 317 (1966)

Degradation of anisomycin after application of various  $^{14}\text{C}$  labeled precursors. For a more detailed description see *ibid.*, **30**, 2334 (1965)

66-286

CURTIS R. F., HARRIES P. C.,  
HASSALL C. H., LEVI J. D.,  
PHILLIPS D. M.

**The biosynthesis of phenols. Part X. Mutation and radioactive tracer studies relating to the biosynthesis of sulochrin.**

J. Chem. Soc. **1966** (C), 168

Degradation of sulochrin, derived either from acetic acid- $2\text{-}^{14}\text{C}$  or diethyl malonate- $2\text{-}^{14}\text{C}$ .

66-287

RAUSCHENBACH P.

**Isotope studies of the biochemistry of fructose metabolism and gluconeogenesis in the liver (Thesis).**

Munich, Tech. Univ., 1964, 107 p.  
N. S. A. **20**, 3684 (1966)

Methods for the determination of  $^{14}\text{C}$  distributions in glucose are described.

66-288

VYKHOVANETS V. V.,  
CHENETS V. V., KNUTOV V. I.,  
KALECHITS I. V.

**Method of determination of the labeled position in six-membered rings.**

Izv. Vysshikh Uchebn. Zavedenii, Khim. i Khim. Tekhnol. **8**, 432 (1965)  
CA **64**, 4883h (1966)

An improved Steinberg-Sixma method of degradation of toluene- $1\text{-}^{14}\text{C}$  is described.

#### 5. — Miscellaneous

66-289

McFARLANE A. S.

**Turnover of labeled plasma proteins.**

Bull. Schweiz. Akad. Med. Wiss. **21**, 173 (1965)

N. S. A. **20**, 6940 (1966)

Various problems associated with the use of labeled plasma proteins in metabolic studies are discussed, such as reutilization of labeled amino acids, in vitro and in vivo methods of synthesizing labeled proteins, self-radiation damage.