

ABSTRACTS SECTION

In this section are given information on methods of synthesizing labelled compounds and related problems (analysis, assaying, purifying, radiodecomposition, storage). The reference cover articles drawn from 40 primary periodicals and also from N.S.A. and C.A.

A point is made of singling out each of the above mentioned aspects in the abstracts, particularly where the greater part of the article deals with applications of labelled compounds. This journal will likewise contain author and subject indexes for each volume.

The articles are abstracted by H. Dwotschak, CID (Euratom).

The work on this information project was started in May 1964. The results obtained until December 1964 have been published in Euratom reports EUR 2212.e and EUR 2212.e suppl., the latter of which contains author and subject indexes.

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1 — SYNTHESIS

1.1 — Deuterium and Tritium Compounds

1.1.1 — GENERAL

65-375

CALF, G. E., GARNETT, J. L.

Sodium borohydride in catalytic deuterium exchange reactions.

J. Phys. Chem. **68**, 3887 (1964)

CA **62**, 9841f (1965)

Exchange reactions generally result in greater isotope incorporation when catalyzed by metal oxides or chlorides activated by redn. with Na borohydride than with H (Fe, Co, Ni, Ru, Rh, Pd, Ir, and Pt). A consistent predominance of ring deuteration is noted in the ethylbenzenes (except Ni).

65-376

GARNETT, J. L., SOLLICH, W. A.

Catalytic deuterium exchange reactions with organics XII. Further studies in platinum catalyst preparation. The process of self-activation.

Aust. J. Chem. **18**, 993 (1965)

Comparison in the properties of prereduced catalysts prepared by a self-activation procedure and catalysts activated conventionally with hydrogen gas. For high-temperature exchange reactions ($>90^\circ$), the former catalysts are to be preferred since higher final activities of up to 300 % may be achieved.

65-377

GARNETT, J. L., SOLLICH, W. A.

Catalytic deuterium exchange reactions with organics XIII. Characteristic reactions of the group VIII transition metals.

Aust. J. Chem. **18**, 1003 (1965)

Activation procedures and hydrogen exchange reactions with Pt, Pd, Ru, Rh, Ir,

Ni. For general catalytic labeling with isotopic hydrogen, platinum was found to be the most efficient of the catalysts investigated.

65-378

GARNETT, J. L.,

SOLLICH-BAUMGARTNER, W. A.

Catalytic deuterium-exchange reactions with organics. XIX. Pi-complex adsorption in the exchange of the alkylbenzenes.

J. Phys. Chem. **69**, 1850 (1965)

N. S. A. **19**, 32199 (1965)

Orientation effects, trends in exchange rates of unhindered ring positions, and comparative rates of aromatic and aliphatic hydrogen exchange in the alkylbenzenes confirmed the relative importance of the dissociative π -complex substitution mechanism.

65-379

GUDKOV, B. S., BALANDIN, A. A., SAVIN E.P.

Isotopic exchange of cyclobutane with D on evaporated metal films.

Dokl. Akad. Nauk. SSSR **162**, 843 (1965)

CA **63**, 11373f (1965)

Films of Pt, Pd, Ni, W, or Mo, between 0 and 171° , no ring scission over Pt, to an insignificant extent over the other catalysts except Ni. The degree of hydrogenolysis increases over Mo, Pd, or Ni and decreases over W with increasing temp.

65-380

RICHTER, W. J., SENN, M., BURLINGAME, A. L.

Convenient labeling technique for mass spectrometry : acid-catalyzed deuterium and oxygen-18 exchange via gas-liquid chromatography.

Tetrahedron Letters **1965** (17), 1235

N. S. A. **19**, 32201 (1965)

Exchange of enolizable hydrogen for deu-

terium by a single passage of sample through a predeuterated alkaline GLC. 96 % Average isotopic purity of ketones. Acidic exchange conditions on a GLC column gave analogous results. Also poly-functional compounds e.g. keto esters and aldehydes, resp., were labeled satisfactorily. The acidic medium allowed extension to ^{18}O labeling for the same compounds. The method is well suited for products available in only minute amounts (see also 65-68).

65-381

ALIPRANDI, B., CACACE, F.,
GUARINO, A.

Chemical effects of nuclear decay in doubly tritiated ethane at atmospheric pressure.

Chem. Effects. Nucl. Transformation, Proc. Symp. Vienna, 1964, 2, 471.

CA 63, 9342f (1965)

Ethane-1,2- ^3H from ethylene and pure T gas over a chromia catalyst that does not promote the exchange between the H atoms of the ethylene and the T.

Diln. with inactive C_2H_6 and purifn. by preparative scale gas chromatography. Samples (0.5 mCi/mmole) were stored for 15-100 days. The decay of one T atom produces a tritiated fragment contg. the other ^3H atom. Identification by gas chromatographic techniques (see also 64-68P).

65-382

MANDESCU, C., GENUNCHE, A.

Tritium : measurement and preparation of labeled molecules.

IFA/CO/29, Institutul de Fizica Atomica, Bucharest 1964.

N. S. A., 19 30300 (1965)

A bibliography of 588 ref. up to the end of 1964 on tritium detection and measurement and on the preparation of tritium-labeled molecules. Subject and author indexes.

65-383

NASH, J. B.

The production of tritium-labeled methane and ethane in the $\text{CH}_4\text{-T}_2$ system (thesis).

UCRL-16009, 1965,

N. S. A. 19, 28363 (1965)

The rates of incorporation of T into labeled methane and ethane in the methane-T system were investigated (additives, pressure, and surface influences). The first term, independent of time, is the decay-induced labeling; the other, inversely proportional to time, is the radiation-induced labeling. Xenon was shown to enhance the product yield by 15 percent in concentrations up to 30 mole percent.

65-384

TANG, Yi-Noo, ROWLAND, F. S.

Recoil tritium reactions with ethyl chloride

J. Am. Chem. Soc. 87, 3304 (1965)

The primary yields of hot tritium reactions with ethyl chloride are estimated in the ratios : HT, 100; $\text{C}_2\text{H}_4\text{TCl}$, 56; $\text{C}_2\text{H}_5\text{T}$, 10; CH_3T , 7; CH_2TCl , 3.

See also : 65-389, α -Hydroxy acids D-lab. by catal. exchange

65-410, D-exchange in the side chain of aromatics

65-551, App. for T-labeling, Wilzbach.

1.1.2 — *ALIPHATIC
COMPOUNDS*

65-385

ANET, F. A. L., HAQ, M. Z.

Ring inversion in cyclohexene.

J. Am. Chem. Soc. 87, 3147 (1965)

The stereoisomeric cis-3,3,4,5,6,6- d_6 -cyclohexane-cis-dicarboxylic acids were treated with lead tetraacetate in pyridine to yield cyclohexene-cis-3,3,4,5,6,6- d_6 .

65-386

BALDWIN, J. E., GREELEY, R. H.

Cycloadditions. IV. Mechanism of the photoisomerization of cis,cis-1,5-cyclooctadiene to tricyclo(3.3.0. O^2 . O^2) octane.

J. Am. Chem. Soc. 87, 4514 (1965)

Cis,cis-1,5-cyclooctadiene-3-d from the resp. 3-bromo-deriv. and LiAlD_4 . 75 %.

65-387

BELANIC-LIPOVAC, V., BORCIC, S.,
SUNKO, D. E.

Secondary hydrogen isotope effects. VII. Ethanolysis rates of 1,1-dimethylallyl-3,3-d₂ chloride (I) and 3,3-dimethylallyl-1,1-d₂ chloride.

Croat. Chem Acta 37, 61 (1965)

CA 63, 9764d (1965)

Prepn. of I.

65-388

BUNCEL, E., SYMONS, E. A.,
ZABEL, A. W.

The deuterioxide-catalyzed hydrogen exchange of dimethylsulfoxide. Preparation of bis(perdeuteriomethyl) sulfoxide, (CD₃)₂SO.

Chem Commun. 1965, 173

CA 63, 4109f (1965)

An Me₂SO-D₂O soln. contg. equiv. amts. of H and D and 0.1 M in NaOD was heated 1 hr. at 100°. After 7 successive equilibrations the title compd. was obtained contg. practically no H. (see also 64-232).

65-389

CALF, G. E., GARNETT, J. L.

Catalytic deuterium exchange reactions with organic compounds. XVII. Novel reactions during the catalytic deuteration of α-hydroxy acids and related compounds.

Tetrahedron Letters 1965 (25), 2105

CA 63, 8248d (1965)

During transition element catalytic labeling, α-hydroxy acids with aromatic substituents decomp. to diaryl ketones, aliphatic α-OH acids such as lactic acid, exchange catalytically with D₂O at 120-30° without decompn.

65-390

COPE, A. C., HEEREN, J. K.

Proximity effects. XLII. The reaction of lithium diethylamide with cis- and trans-4-octene oxide.

J. Am. Chem. Soc. 87, 3125 (1965)

cis-4-Octene oxide-4,5-d₂ (I) from 4-octyne + deuterio-borane and treatment with deuterioacetic acid → 85 % olefin (80 % d₂), + monoperphthalic acid → 47 % I (80 % d₂).

The corresp. trans-compound by treating 4-octyne with calcium ammonia-d₃ and than as above (70 % from octyne, 92 % d₂).

65-391

DENO, N. C., RICHEY, H. G. Jr.,
LIU, J. S., LINCOLN, D. N.,
TURNER, J. O.

Carbonium ions. XIX. The intense conjugation in cyclopropyl carbonium ions.

J. Am. Chem. Soc. 87, 4533 (1965)

α,α'-d₂-Tricyclopropylmethanol (I) from 1,7-dichloro-4-heptanone, exchange of α-hydrogens with D₂O/PCl₅ (93 % D) boiling with NaOH (20 %) for 30 min. → dicyclopropyl ketone (86 %, 75 % D), + cyclopropyllithium → I.

65-392

DUFFIELD, A. M., BEUGELMANS, R.,
BUDZIKIEWICZ, H., LIGHTNER, D.A.,
WILLIMAS, D. H., DJERASSI, C.

Mass spectrometry in structural and stereochemical problems. LXIII. Hydrogen rearrangements induced by electron impact on N-n-butyl- and N-n-pentylpyrroles.

J. Am. Chem. Soc. 87, 805 (1965)

From methylmalonate, D-exchange, LiAlH₄ redn. + HBr → bromopropane-2,2-d₂, Grignard reagent, CO₂, . . . → bromobutane-3,3-d₂; Grignard reagent + ethylene oxide → bromopentane-4,4-d₂. Pyrrole-2,3,4,5-d₄ by heating pyrrole, D₂O, and Pd/C in a sealed tube.

65-393

FRANZUS, B., SNYDER, E. I.

The mechanism of lithium aluminium hydride double-bond reductions in the 7-substituted norbornadienes and syn-7-substituted norbornenes.

J. Am. Chem. Soc. **87**, 3423 (1965)

7-Acetylnorbornadiene (I) + LiAlH₄, decompn. of the adduct with D₂O → exo-5-d-anti-7-norbornenol. I and LiAlD₄, + D₂O → exo, exo-5,6-d₂-anti-7-norbornenol.

65-394

KOURIM, P., VACEK, K.

Origin of the E. S. R. spectrum of γ -irradiated poly(methyl methacrylate).

Trans. Faraday Soc. **61**, 415 (1965)

CA **62**, 11928d (1965)

CDH : C(Me)CO₂Me by deuterating catalytically BrCH : CMe-COONa in D₂O with Pd on BaSO₄. p-Toluenesulfonic acid-d + CH₂N₂, methylation of dimethylmalonate with this ester gave finally CH₂ = C(CH₃D)COOMe.

65-395

LEE, C. C., KRUGER, J. E.,
WONG, E. W. C.

On the problem of 1,3-hydride shifts during nitrous acid deamination of 1-propylammonium perchlorate.

J. Am. Chem. Soc. **87**, 3985 (1965)

Five successive exchanges of methylmalonic acid and D₂O, decarboxylation → 2,2-d₂-propionic acid → amide, + LiAlH₄ + HClO₄ → 2,2-d₂-1-propylammonium perchlorate.

65-396

LEE, C. C., WONG, E. W. C.

α -Deuterium kinetic isotope effects in solvolyses of endo-norbornyl p-bromobenzene-sulfonate.

Can. J. Chem. **43**, 2254 (1965)

Norcamphor + LiAlD₄ → endo-nor-borneol-2-d → title compd. Exo-isomer (about 10 %) was removed by selective solvolysis. 94 % D.

65-397

ROTH, W. R., KÖNIG, J.

Thermische Isomerisierung von cis-Hexadien-(1.4).

Ann. Chemie **688**, 28 (1965)

Grignard reagent of 1-penten-4-yne + CD₃I → 1-hexen-4-yne-6,6,6-d₃, hydrogenation → 1,4-hexadiene-6,6,6-d₃.

65-398

SCHAEFER, J. P., WEINBERG, D. S.

Deuteration of ketones through enamines.

Tetrahedron Letters **1965** (23), 1801.

CA **63**, 6876h (1965)

POCl₃ + D₂O, + C₃H₁₂, + enamine in C₅H₁₂ → org. soln. of the ketone : 1-morpholinocyclohexene → pure 2-deuterio-cyclohexanone in high yield; 4-tert-butyl-1-morpholino-cyclohexene → 2- β -deuterio-4-tert-butylcyclohexanone.

65-399

THOMAS, A. F., WILLHALM, B.

Peculiarity in the deuteration of bicyclo (2.2.1)heptanones.

Tetrahedron Letters **1965** (18), 1309

CA **63**, 7047h (1965)

Isofenchone 3 days with NaOD in 50 % dioxane-D₂O at 20° C → exo-monodeuterated isofenchone with 97 % isotopic purity. The same exo-monodeuteration was observed with camphor (85 %, one exchange). Norcamphor under the same conditions → 60 % d₁ species and only 34 % d₂, changing to 46 % d₁ and 49 % d₂ after a 2nd exchange.

65-400

RETEY, J., LYNEN, F.

Zur biochemischen Funktion des Biotins. IX. Der sterische Verlauf der Carboxylierung von Propionyl-CoA.

Biochem. Z. **342**, 256 (1965)

(2R,3R)-2,3-Epoxybutane + LiAlT₄ → (2R,3S)-3-³H-butanol-2, haloform reaction → (S)-2-³H-propionic acid (56 %, 1,8 × 10⁵ i.p.m./ μ mole), enzymic transformation to propionyl-CoA.

65-401

STOFFEL, W.

Chemical synthesis of ³H- and ¹⁻¹⁴C-labeled polyunsaturated fatty acids.

J. Am. Oil Chemist's Soc. **42**, 583 (1965)

CA **63**, 8648b (1965)

Details for the synthesis of ^3H -labeled γ -linolenic acid are given and methods of ozonolysis for detg. the structure of unsatd. fatty acids are described.

65-402

UCHIDA, T.

Synthesis of ^3H - or ^{32}P -labeled O,O-dimethyl S-(methylcarbamoylmethyl) phosphorodithioate and the chromatography of related compounds.

Yakugaku Zasshi **85**, 638 (1965).

CA **63**, 9799d (1965)

$\text{C}^3\text{H}_5\text{OH} + \text{P}_2\text{S}_5 + \text{NH}_3 + \text{ClCH}_2\text{CONHMe} \rightarrow$ title compd.- ^3H .

65-403

WEISS, B.

Synthesis of DL-1,2-dihydroxyhexadecane, DL - erythro - 1,2,3 - trihydroxyhexadecane, and DL-1,2-dihydroxy(1,3,4- ^3H)hexadecane. Metabolism of (1,2- ^3H)palmitaldehyde and DL-1,2-dihydroxy(1,3,4- ^3H)hexadecane.

Biochemistry **4**, 1576 (1965)

DL - 1,2 - Dihydroxyhexadecane - 1,3,4 - ^3H from trans-2-hexadecenoic acid, reacting it successively with diazomethane, perbenzoic acid, and LiAlH_4 - ^3H .

Detn. of the isotope distribution by periodate oxidation.

See also : 65-502, 1-0-hexadecyl glycerol- ^3H .

1.1.3 — AROMATIC COMPOUNDS

65-404

COHEN, Th., SONG, Il Hwan.

Nucleophilic acylation utilizing an ylid intermediate. A simple synthesis of benzaldehyde- d_1 .

J. Am. Chem. Soc. **87**, 3780 (1965)

Phenylglyoxylic acid, dissolved in D_2O and evaporated to dryness (twice) is decarboxylated in the presence of carboxylic acid

anhydrides (benzoic anhydride) and pyridine to the title compd. in 88 % yield, 92 % D.

65-405

ILLUMINATI, G., STEGEL, F.

Kinetic hydrogen isotope effect in the silver ion-catalyzed bromination of 1,3,5-tri-tert-butylbenzene.

Ric. Sci., Rend., Sez. A7, 460 (1964)

CA **63**, 5466c (1965)

2-Bromo-1,3,5-tri-tert-butylbenzene, halogen-metal interconversion with BuLi, hydrolysis with heavy water \rightarrow 1,3,5-tri-tert-butylbenzene-2-d.

65-406

KICE, J. L., ENGBRECHT, R. H., PAWLOWSKI, N. E.

The thermal decomposition of thiolsulfonates. IV. The stereochemistry of the reaction.

J. Am. Chem. Soc. **87**, 4131 (1965)

(-)-Benzyl- α -d alcohol + phosgene, refluxing in dioxane \rightarrow benzyl- α -d chloride, optically active, + sodium sulfite \rightarrow corresp. sulfonate \rightarrow sulfonyl chloride \rightarrow sulfinate, + PhSCl \rightarrow phenyl α -toluenethiolsulfonate- α -d, optically active.

65-407

KOENIG, T. W., BREWER, W. D.

Deuterium isotope effects in the decompositions of acetyl peroxide and two tert-butyl peresters.

Tetrahedron Letters **1965**, 2773.

CA **63**, 11278g (1965)

$\text{PhCH}(\text{Me})\text{CO}_2\text{CMe}_3$ (70 % β -D) from MeCOPh, exchanged in basic D_2O , LiAlH_4 , conversion to the chloride, + cyanide, basic hydrolysis \rightarrow acid (with some loss of D).

65-408

KOPTYUG, V. A., SHUBIN, V. G., KORCHAGINA, D. V.

Migration of a methyl group in heptamethylbenzenonium ion. A new route to perdeuteriohexamethylbenzene.

Tetrahedron Letters **1965** (21), 1535

CA **63**, 6805d (1965)

$\text{CF}_3\text{CO}_2\text{D}$ + 4-methylene-1,1,2,3,5,6-hexamethylcyclohexa-2,5-diene 15 min. at 70° C and 90 % acid evapn. in vacuo at 20°, repetition of the process 6 times, → perdeuteriohexamethylbenzene, contg. 98 atom % D.

65-409

LAMBERT, J. B., ROBERTS, J. D.

Nuclear magnetic resonance spectroscopy. Conformational properties of cyclobutanes. Variation of vicinal hydrogen-fluorine coupling constants with temperature.

J. Am. Chem. Soc. **87**, 3891 (1965)

Acetophenone + LiAlD_4 → α -methylbenzyl- α -d alcohol (90,9 %), $-\text{H}_2\text{O}$ (p-toluene-sulfonic acid) → styrene- α -d (83,3 %).

65-410

MACDONALD, C. G., SHANNON, J. S.

Nickel-catalysed hydrogen exchange of alkylaromatic hydrocarbons and toluic acid derivatives with deuterium oxide.

Aust. J. Chem. **18**, 1009 (1965)

Selective hydrogen exchange of alkyl groups of some alkylaromatic hydrocarbons and toluic acid derivs. by reaction of these compounds with deuterium oxide over nickel on kieselguhr at 99°. Some nitro- and halo-toluenes underwent little or no exchange.

65-411

RIEKER, A., ZIEMEKE, P.

Die Synthese von Derivaten des Hexadeuterobenzols.

Z. Naturforschg. **20b**, 640 (1965)

Hexadeuteriobenzene was transformed to 15 deuterated compds. by successive transformations; the D-content was determined by ir, nmr, esr and mass spectroscopy. (mono- and dibromo-, nitro-, amino-,

hydroxy-, 4-hydroxy-1,3,5-tri-tert.-butyl-deuteriobenzene, oxidn. to the benzoquinone and semiquinone derivs., Grignard reagent and the mercury- and aluminium derivs. from the latter).

See also : **65-479**, α -chloro- α - d_2 -toluene.

1.1.4 — HETEROCYCLIC COMPOUNDS

65-412

BEAK, P., BONHAM, J.

The deuteration of some N-methyl-4-pyridones.

J. Am. Chem. Soc. **87**, 3365 (1965)

In contrast to other α , β -unsaturated carbonyl systems N-methyl-4-pyridone (1), 3,5-dimethyl-N-methyl-4-pyridone (2), and 3,5-dibromo-N-methyl-4-pyridone (3) substitute deuterium for protium at the β -(2 and 6)-position in basic deuterium oxide at 100°.

1 : 39 %, 95 ± 5 % D in pos. 2 and 6; 2 : 77 %, D as above; 3 : 90 %, 94 ± 2 % D in pos. 2 and 6.

65-413

KAWAZOE, Y., OHNISHI, M., YOSHIOKA, Y.

Hydrogen-abstracting reactions. I. Deuteration of pyridines and pyridazines.

Chem. Pharm. Bull. (Tokyo) **12**, 1384 (1964)

CA **62**, 5274f (1965)

Deuteration of pyridine N-oxide only in an alk. medium. Stepwise deuteration at the 6, 5, 4, and then 3 positions in pyridazine N-oxide.

65-414

CLARKE, G. M., SYKES, P.

Reduction of thiazolium salts with sodium borohydride.

Chem. Commun. **1965**, 370

CA **63**, 11292f (1965)

3-Benzyl-4-methylthiazolium bromide in D_2O for 46 hrs. at room temp. complete

exchange at C-2, + NaBH₄ → 3-benzyl-4-methylthiazolidine-2,2-d₂.

65-415

WEISSBACH, A., LISIO, A.

Alkylation of nucleic acids by mitomycin C and porfiromycin.

Biochemistry 4, 196 (1965)

Exposure of mitomycin C to 15 curies of ³H₂ for 1 week at 0°. Purifn. on a 100-ml cellulose powder column, equilibrated with the benzene-methanol-phosphate solvent of Lefemine et al. Sp. act. : 0.5 μCi/μmole.

See also : 65-392, Pyrrole-2,3,4,5-d₄

65-462, 3-Hydroxy-L-kynurenine-³H

65-479, 2-Chloromethyl-d₂-thiophene

65-496, Deuterated quinoline 1-oxide-1-¹⁵N, and 4-nitro-¹⁵N-quinoline 1-oxide.

1.1.5 — ALKALOIDS

65-416

HESPE, W., KLOPPER, W. J. F.

Synthesis of tropine-6,7-t₂.

Rec. Trav. Chim. 84, 476 (1965)

CA 63, 4352a (1965)

2,5-Dimethoxy-2,5-dihydrofuran + gaseous T, hydrolysis → (CH₂CHO)₂-2,3-³H, Robinson-Schoepf reaction, hydrogenation over Raney Ni → title compd., sp. act. 117 mCi/g.

65-417

RABITZSCH, G., HERZMANN, H.

Kieselgel als Träger bei Tritium-Markierungen von Herzglykosiden.

Ann. Chem. 685, 261 (1965)

Higher labeling rates with good yields by use of silica gel as carrier in T labeling by the Wilzbach method of digitoxin-U-³H (sp. act. of 590 mCi/mmole). Labeling up to an act. of 1-2 Ci/mmole are possible.

1.1.6 — CARBOHYDRATES

65-418

MACKIE, W., PERLIN, A. S.

Nuclear magnetic resonance spectral observations on the glycol-scission of deuterated D-glucose.

Can. J. Chem. 43, 2645 (1965)

D-Glucose-5-d from D-xylo-5-hexulosonic acid by NaBD₄ redn. to D-gluconic and L-idonic acids-5-d, lactonisation, + NaBH₄ in the presence of a cation exchange resin → D-glucose- and L-idose-5-d (in low yields!), acetonation and fractional crystn., methylation, hydrolysis → 3-0-methyl-D-glucose-5-d. D-Glucose-6,6'-d₂ from 1,2-0-isopropylidene-D-glucofuranurono-6,3-lactone + NaBD₄, acid hydrolysis.

65-419

MACKIE, W., PERLIN, A. S.

1,2-0-Isopropylidene-α-D-glucofuranose-5-d and -5,6,6'-d₃.

Can. J. Chem. 43, 2921 (1965)

1,2-0-Isopropylidene-α-D-glucofuranurono 6,3-lactone + CrO₃ → 5-keto deriv. (I). Redn. with NaBD₄ → 1,2-0-isopropylidene-α-D-glucofuranose-5,6,6'-d₃ in almost quant. yield. Conversion of I to the sodium salt and NaBD₄ redn. → uronic acid-5-d, lactonisation, NaBH₄ → 2 : 1 mixture of 1,2-0-isopropylidene-α-D-glucose-5-d and the corresp. L-ido deriv. in higher yields than described in the preced. abstr.

65-420

LEHMANN, J.

Synthese von (5-³H)-α-Methyl-D-glucosid und (5-³H)-β-Methyl-L-idosid durch Hydroborierung von substituierten Methylglucosiden.

Angew. Chem. 77, 863 (1965)

Trimethyl- (1) or tris-(trimethylsilyl)-ether (2) of α-methyl-glucopyranoside-5-ene + ³H-diborane → title compds. in a 1 : 2 and 1 : 0,6 ratio resp. The total yield was 85-90 %.

65-421

NORDIN, P., MOSER, H. C.,
SENNE, J. K.

Tritiated starch granules.

Biochem. J. **96**, 336 (1965)

A technique is described for surface-labeling of starch granules by tritiation.

1.1.7 — *PEPTIDES, AMINO
ACIDS, PROTEINS*

65-422

LIN, Song-Ling, BLAKE, M. I.,
SIEGEL, F. P.

Deuterium isotope effects in nonenzymatic transamination of L-glutamic acid.

J. Pharm. Sci., **54**, 354 (1965)

N. S. A. **19**, 25975 (1965)

Culture of the algae *Scenedesmus obliquus* in 99 % D₂O provided as one of the more abundant fully deuterated amino acids, L-deuterio-glutamic acid, which was isolated by gradient elution chromatography on a strong cationic exchange resin. Identification by paper chromatography, elemental analysis, m.p. determination, NMR spectrum analysis, and determination of the specific rotation.

65-423

BROWN, F. Ch., MITCHELL, R. J.

The distribution and elimination of tritiated porcine ceruloplasmin in the rat.

Can. J. Biochem. **43**, 1455 (1965)

Ceruloplasmin (80-95 % pure) + T (3 Ci, 250 mm, 0° C, 4 days), after different purification steps 5-8 % yields, sp. act. : 346-861 mCi/mole.

65-424

COLLIPP, P. J., KAPLAN, S. A.,
BOYLE, D. C., SHIMIZU, C. S. N.,
LING, S. M.

Tritium-labeled peptide hormones with high specific radioactivity.

Nature **207**, 876 (1965)

Prepn. of tritium-labeled hormones by acetylation with tritiated acetic anhydride. Human growth hormone (3.2 acetyl/mole, 275 μCi/mg) bovine growth hormone (12 acetyl/mole, 570 μCi/mg), and pork insulin (127 μCi/mg, 0.5 acetyl/mole) (see also **65-135**).

65-425

GOSZTONYI, T., MARTON, J.,
KOVACS, A.

Labeling of beta-lipoprotein with tritium.

Nature **208**, 381 (1965)

The tritiating reagent is CH₃COOHT.BF₃+ CH₃COO⁻ (by refluxing acetic anhydride with tritiated water and saturating the formed tritiated acetic acid with BF₃ gas). Labeling of β-lipoprotein by shaking it for 24 h with the reagent at room temperature, subsequent lyophilization. No further purifn. necessary; sp. act. : 0,722 μCi/ml soln. Similarly phenylalanine, L-serine, L-tyrosine, L-tryptophan, L-methionine, cholesterol and acetic acid, have been labeled; sp. act. about 1 μCi/mg.

65-426

HILL, D. K.

The space accessible to albumin with the striated-muscle fibre of the toad.

J. Physiol. (London) **175**, 275 (1964)

N. S. A. **19**, 35918 (1965)

Crystallized bovine plasma albumin-³H by two methods : catalytic gas exposure; and acetylation with tritiated acetic anhydride.

65-427

NISHIZAWA, E. E., BILLIAR, R. B.,
KARR, J., EIK-NES, K. B.

Metabolism in vitro of tritiated adrenocorticotrophic hormone.

Can. J. Biochem. **43**, 1489 (1965)

ACTH + T (3 Ci, 10 days, 0° C, 250 mm); sp. act. 4000 d.p.m./μg.

See also : **65-467**, β-Lactoglobulin-³H.

1.1.8 — STEROIDS

65-428

DJERASSI, C.,
von MUTZENBECHER, G., FAJKOS, J.,
WILLIAMS, D. H., BUDZIKIEWICZ, H.

Mass spectrometry in structural and stereochemical problems. LXV. Synthesis and fragmentation behavior of 15-keto steroids. The importance of interatomic distance in the McLafferty rearrangement.

J. Am. Chem. Soc. **87**, 817 (1965)

17,17-Ethylenedioxy- Δ^5 -androsten-3 β -ol acetate, + N-bromosuccinimide (α -bromo-), + LiAlD₄ \rightarrow dehydroisoandrosterone-7 β -d₁ 17-ethylene ketal. \rightarrow 4-androstene-3,17-dione-7 β -d₁ 17-ethylene ketal, Li/NH₃ and Wolff-Kishner redn. \rightarrow 5 α -androstan-17-one-7 β -d₁; bromination in pos. 16. -HBr, epoxidn., hydrazine redn., oxidn. by the Jones procedure, hydrogenation and oxidn. \rightarrow 5 α -androstan-15-one-7 β -d₁.

65-429

FISHMAN, J.

The synthesis and nuclear magnetic resonance spectra of epimeric 16-deuterio-17 β - and -17 α -estradiols.

J. Am. Chem. Soc. **87**, 3455 (1965)

16 α -Hydroxyestrone (I) \rightarrow ditosylate, + LiAlD₄ \rightarrow 16 β ,17 α -dideuterio-17 β -estradiol \rightarrow 3-monobenzoate, oxidn. with Jones reagent \rightarrow 16 β -deuterioestrone benzoate, + LiAlH₄ \rightarrow 16 β -deuterio-17 β -estradiol. A second sequence was LiAlD₄ redn. of the 16 α ,17 α -epoxide, \rightarrow 16 β -deuterio-17 α -estradiol, benzoate, then as above \rightarrow I. Estrone enol diacetate (II) + LiAlH₄, + D₂O \rightarrow 16 α -deuterio-17 β -estradiol (III). Catalytic redn. of II in dimethoxyethane with D₂, hydrolysis \rightarrow 16 α ,17 α -dideuterio-17 β -estradiol (IV), III and IV were transformed to 16 α -deuterio-17 β - (redn. with LiAlH₄) or -17 α -estradiol (epimerisation of the tosylate).

65-430

JERUSSI, R. A.

The stereochemistry of the kinetically

controlled bromination of 19-methyl-5 α -3-keto steroids.

J. Org. Chem. **30**, 1650 (1965)

Deuteration of 5 α -androstan-3,17-dione in anhyd. diglyme with 99.8 % D₂O/KOD \rightarrow 2,2,4,4,16,16-hexadeuterio-5 α -androstan-3,17-dione.

65-431

JERUSSI, R., RINGOLD, H. J.

The mechanism of the bacterial C-1,2 dehydrogenation of steroids. III. Kinetics and isotope effects.

Biochemistry **4**, 2113 (1965)

5 α -Androstan-3,17-dione-2 β -d (0,96 g-atom D) from 2 α ,3 α -oxido-5 α -androstan-17-one + LiAlD₄, CrO₃; the corresp. 1 α -d-deriv. (0,856 g-atom D) (I) by catalytic redn. of 17-hydroxy-5 α -androst-1-en-3-one and CrO₃ oxidn. 17 β -Hydroxy-5 α -androstan-3-one-2,2,4,4-d₄ (3,75 g-atom D) by exchange in anhydrous diglyme/Na/D₂O. Androst-4-ene-3,17-dione-1 α ,2,2,4,6,6,16,16-d₈ from the 1 α -d-deriv. by exchange as above. By the same way 5 α -androstan-3,17-dione-1 α ,2,2,4,4,16,16-d₇ (6,78 g-atoms D) from I.

65-432

MALHOTRA, S. K., RINGOLD, H. J.

Chemistry of conjugate anions and enols. V. Stereochemistry, kinetics, and mechanism of the acid- and enzymatic-catalyzed isomerization of Δ^5 -3-keto steroids.

J. Am. Chem. Soc. **87**, 3228 (1965)

4 β -d-3 β ,17 β -Dihydroxyandrost-5-ene from the corresp. 6 β -chloro-4-ene compd. and LiAlD₄; oxidn. to 4 β -d-androst-5-ene-3,17-dione.

Exchange of protons in the Δ^5 -3-keto steroid provided 4,4 β -d₂-androst-5-ene-3,17-dione (68.6 % d₂).

65-433

DORFMAN, R. I.

Steroid hormones in relation to irradiation. TID-21859 Progress Report, 1950-1963

N. S. A. **19**, 29854 (1965)

Fifty-four ^{14}C and ^3H labeled steroids were synthesized.

65-434

OERTEL, G. W., GROOT, K.,
WENZEL, D.

Lipophilic steroid conjugates. I. In vivo experiments with a biosynthetic lipophile, dehydroepiandrosterone conjugate.

Acta Endocrinol. **49**, 525 (1965)

CA **63**, 10269h (1965)

Dehydroepiandrosterone- 7α - ^3H sulfatide by incubating guinea pig liver mitochondria with ammonium dehydroepiandrosterone- 7α - ^3H sulfate in the presence of ATP, CoA, and MgCl_2 , followed by purifin.

65-435

PURDY, R. H., HALLA, M., LITTLE, B.

Biosynthesis of 4 - ^{14}C - and 7α - ^3H -labeled 20α -hydroxypregn-4-en-3-one and 7α - ^3H - 3β , 20α -dihydroxypregn-5-ene.

Steroids **4**, 625 (1964)

N. S. A. **19**, 32254 (1965)

With the aid of 20α -hydroxysteroid dehydrogenase from human placenta using ^{14}C - and ^3H -labeled progesterone, the title compds. were prepd. Radiochem. purity was checked by countercurrent distribution.

65-436

SCALLEN, T. J.

Chemical synthesis of cholesta-5,7,24-trien- 3β -ol and demonstration of its conversion to cholesterol in the rat.

Biochem. Biophys. Res. Commun. **21**, 149 (1965)

Cholesta-5,7,24-trien- 3β -ol- 3α - ^3H from cholesta-5,24-dien- 3β -ol, Oppenauer oxidn., + ethyl orthoformate and p-toluene-sulfonic acid \rightarrow 3-ethoxy-cholesta-3,5,24-triene, MnO_2 -oxidn., \rightarrow 3-acetoxy-cholesta-3,5,7,24-tetraene, + NaB^3H_4 , sp. act. : 1.167×10^4 c.p.m./ μg .

See also : **65-476**, 6-Azacholesterol- ^3H .

1.2 — Carbon-13 and -14 Compounds

1.2.1 — GENERAL

65-437

FURUKAWA, N.

Direct labeling of organic substances by nuclear reactions.

Genshiryoku Kogyo **10**, 49 (1964)

N. S. A. **19**, 26457 (1965)

In the reaction $^{14}\text{N}(n, p)^{14}\text{C}$ high density of nitrogen atoms, high neutron flux, and long irradiation are necessary. The results showed that the specific radioactivities were low and the conversions were 1-3 %.

65-438

STÖCKLIN, G.

Zur Chemie Nukleogener Kohlenstoffatome.

Jül-228-RC, Juli 1965

^{14}C Recoil reaction with hydrocarbons in the gas and liquid phase, with or without oxygen and methylamine resp. Reaction mechanisms.

1.2.2 — ALIPHATIC COMPOUNDS

65-439

ÄNGGARD, E., SAMUELSSON, B.

Prostaglandins and related factors. XLII. Metabolism of prostaglandin E_3 in guinea pig lung.

Biochemistry **4**, 1864 (1965)

5,8,11,14,17-Eicosapentaenoic acid- ^{14}C (I) by incubating acetate- 1 - ^{14}C to a medium on which *Euglena gracilis* Z was grown. Isolation by prep. T. L. C. on AgNO_3 -impregnated silica gel; 8 % radioactivity incorporation, sp. act. : ~ 2 $\mu\text{Ci}/\text{mg}$. Conversion of I to PGE_3 - ^{14}C using homogenates of vesicular gland from sheep, 17 % conversion.

65-440

BUHLER, M. F., MITTA, A. E. A.,
LOPEZ, R.**Preparation of DL-tartaric-1,4-¹⁴C acid.**Anales Asoc. Quim. Arg. **51**, 330 (1963)CA **63**, 10969f (1965)Glyoxal + NaHSO₃ + K¹⁴CN (4 mCi), +
HCl, sapon., yield 34 %.

65-441

DUTKA, F., TUDOS, H., OTVOS, L.

Reaction between methyl iodide and methanol.Atompraxis **10**, 536 (1964)CA **62**, 11648b (1965)¹⁴CH₃I and dry MeOH, 16 hrs. at 100° in
a sealed tube under N → 35 % di-Me ether
based on ¹⁴C. The reaction rate decreased
with increasing C chain length.

65-442

FACTOR, A., RUSSELL, C. A.,
TRAYLOR, T. G.**Bimolecular combination reactions of oxy radicals.**J. Am. Chem. Soc. **87**, 3692 (1965)Di-tert-butyl peroxyoxalate-methyl-¹⁴C
from ¹⁴CH₃MgI + acetone, tert-butyl
hydroperoxide, + (COCl)₂ → final prod.,
4900 c.p.m./mg.

65-443

GOETSCHER, C. T., PINES, H.

Alumina : catalyst and support. XXVII. Aromatization of methylcycloheptane and methyl-¹⁴C-cycloheptane over chromia-alumina catalyst. Contribution to the mechanism of aromatization.J. Org. Chem. **30**, 3544 (1965)Methyl-¹⁴C-cycloheptane (>99 % purity)
from bromocycloheptane, Mg, ¹⁴CO₂, H⁺,
LiAlH₄, AcCl, heating, hydrogenation.
Over-all yield : 22,4 % from Ba¹⁴CO₃.

65-444

JOHNSTON, N. C., LAW, J. H.,
WEAVER, N.**Metabolism of 9-ketodec-2-enoic acid by worker honeybees (*Apis mellifera* L.).**Biochemistry **4**, 1615 (1965)Inactive title compd. → corresp. ketal ester,
ozonisation, condensation of the C₈-alde-
hyde with malonic acid-2-¹⁴C by the method
of Jaeger and Robinson (Tetrahedron **14**,
320) → 45 % 9-ketodec-2-enoic acid-2-¹⁴C
and 52 % 3-ene-isomer; sepn. by a selective
esterification procedure; sp. act. 9,6 × 10⁶
d.p.m./mg.

65-445

KLIMASHEVSKAYA, VOLKOVA, V. S.

Preparation of stearic-1-¹⁴C acid and palmitic-1-¹⁴C acid.Tr. Gos. Inst. Prikl. Khim. **52**, 48 (1964)CA **63**, 11346a (1965)Inactive title compds., Hunsdiecker reac-
tion, + K¹⁴CN and hydrolysis (KOH) →
title compds. in yields of 83-6 % and
60-8 % resp. (from the bromides).

65-446

KOPACZYK, K. C., RADIN, N. S.

In vivo conversions of cerebroside and ceramide in rat brain.J. Lipid. Res. **6**, 140 (1965)CA **62**, 10946b (1965)Lignoceric acid-1-¹⁴C → the corresp. acyl
chloride, + psychosine sulfate → ligno-
ceroyl psychosine (kerasin). Stearoyl sphin-
gosine (ceramide) similarly from stearic
acid-1-¹⁴C.

65-447

MUHS, M. A., BASTIN, E. L.,
GORDON, B. E.**¹⁴C-Labeling using carbene insertion-application to saturated hydrocarbons.**p. 39-48 of Advances in tracer methodo-
logy. Vol. 2 (1965)N. S. A. **19**, 32258 (1965)About one half of the activity in the ¹⁴C
source (N-methyl-¹⁴C-N-nitroso-p-toluene-
sulfonamide) can be incorporated in the
final products starting from a single mate-
rial. By use of preparative-scale gas chro-
matography, products of 99,9 % chemical
purity can be isolated.

65-448

PERLMAN, D., SEMAR, J. B.

Preparation of amphotericin B-¹⁴C.

Biotechnol. Bioeng. 7, 133 (1965)

N. S. A. 19, 28424 (1965)

The specific activity of the crude amphotericin B recovered from fermentation supplemented with acetate and propionate precursors at a level of 1 μ Ci/ml ranged from 10 to 25 μ Ci/g.

65-449

PINES, H., DEMBINSKI, J. W.

Alumina : catalyst and support. XXV. Aromatization of 2-methylhexane-6-¹⁴C, 3-methylhexane-5-¹⁴C, and 3-methyl-¹⁴C-hexane over chromia-alumina catalyst. Contribution to the mechanism of aromatization.

J. Org. Chem. 30, 3537 (1965)

3-Methyl-¹⁴C-hexane (99 % purity) from 3-bromohexane via the Grignard reagent, ¹⁴CO₂, LiAlH₄, acetate, methylene-deriv. and hydrogenation. Over-all yield, 16 %. 3-Methylhexane-5-¹⁴C (>99 % purity) from 1-bromo-2-methylbutane via 1-bromo-3-methylpentane-1-¹⁴C as above. 2-Methylhexane-6-¹⁴C from 1-bromo-4-methylpentane, Mg, ¹⁴CO₂, H⁺, LiAlH₄, Ni-Kieselguhr/thiophene.

65-450

PINES, H., GOETSCHER, C. T.

Alumina : catalyst and support. XXVIII. Aromatization and dehydroisomerization of 3- and 4-methylheptane and 3- and 4-methyl-¹⁴C-heptane. Contribution to the mechanism of aromatization.

J. Org. Chem. 30, 3548 (1965)

3-Methyl-¹⁴C-heptane (>99 % purity) from 3-bromoheptane, Mg, ¹⁴CO₂, LiAlH₄, AcCl, heating, hydrogenation. Over-all yield : 12 % from Ba¹⁴CO₃. Similarly 4-methyl-¹⁴C-heptane (41.6 %).

65-451

RICHARDSON, D. B., DURRETT, L. R., MARTIN, J. M. Jr., PUTMAN, W. E., SLAYMAKER, S. C., DVORETZKY, I.

Generation of methylene by photolysis of hydrocarbons.

J. Am. Chem. Soc. 87, 2763 (1965)

CA 63, 5511c (1965)

9,10-Dihydro-9,10-methanophenanthrene (I) and phenylcyclopropane (II) yield methylene, when photolyzed, which inserts randomly into the carbon-hydrogen bonds of alkanes. I and II can be used for ¹⁴C-labeling via methylene insertion.

See also : 65-401, Fatty acids-1-¹⁴C, unsaturated.

1.2.3 — *AROMATIC COMPOUNDS*

65-452

CAMPAIGNE, E., COLLINS, C. J.

An investigation of abnormal products in the reaction of benzyl and 2-thenyl Grignard reagents with carbon dioxide-¹⁴C.

J. Heterocyclic Chem. 2, 136 (1965)

CA 63, 4235c (1965)

Neither o = nor p-toluic acids are formed during the reaction of benzylmagnesium bromide with CO₂. 2-Thenylmagnesium chloride reacts to produce 64 % 2-thenylacetic acid, 30 % 2-methyl-3-thenoic acid, and 1.0-1.5 % 5-methyl-2-thenoic acid.

65-453

STOCK, L. M., SUZUKI, J.

Electron paramagnetic resonance spectra of semiquinones. II. Coupling constants of β -nuclei.

J. Am. Chem. Soc. 87, 3909 (1965)

Grignard reagent of methyl iodide-¹³C + acetone \rightarrow tert-butylalcohol-¹³C, + hydroquinone (in phosphoric acid and xylene) \rightarrow 2-tert-butyl- β -¹³C-hydroquinone (30 %).

65-454

WILLIAMS, E. A., MEIKLE, R. W., REDEMANN, C. T.

Radiosynthesis of carbon-14-labeled 4-dimethylamino-3,5-xylyl methylcarbamate.

J. Agr. Food Chem. **13**, 210 (1965)
CA **63**, 4192h (1965)

Labeling of the title compd. in the carbonyl group in 46 % yield based on radioactivity by the conversion of acetic anhydride-1,1-¹⁴C to Me isocyanate, + 4-dimethylamino-3,5-xyleneol. Labeling in the 1-position in the ring in 3 % yield by the addn. of ¹⁴CO₂ to the di-Grignard reagent of 1,5-dibromo-2,4-dimethylpentane and catalytic conversion to 3,5-xyleneol, followed by nitrosation, hydrogenation, methylation, and reaction with Me isocyanate. Labeling of both the 3-position in the ring and the 3-Me group in 10 % yield by the reaction of acetaldehyde-1,2-¹⁴C with Et acetoacetate and conversion to 3,5-xyleneol.

65-455

WRIGHT, A. S., AKINTONWA, D. A. A.
CROWNE, R. S., HATHWAY, D. E.

The metabolism of 2,6-di-tert-butyl-4-hydroxymethylphenol (Ionox 100) in the dog and rat.

Biochem. J. **97**, 303 (1965)

(¹⁴C)Ionox 100 (0.766 μCi/mg.) by adding K tert.-butoxide in tert.-butyl alcohol to 2,6-di-tert.-butylphenol and (¹⁴C)paraformaldehyde.

65-456

FALECKI, J., SZUCHNIK, A.

Synthesis of salicyclic acid (¹⁴CO₂H).

J. Prakt. Chem. **28**, 119 (1965)

CA **63**, 5553f (1965)

o-Methoxy-bromobenzene → Grignard reagent, + ¹⁴CO₂, + HI treatment → 64 % title compd., 4000 c.p.m./mg.

65-457

WEGMAN, J. DEMOSS, J. A.

The enzymatic conversion of anthranilate to indolylglycerol phosphate in *Neurospora crassa*.

J. Biol. Chem. **240**, 3781 (1965)

Anthranilic acid-ring-¹⁴C from ring labeled ¹⁴C-DL-tryptophan, supplied as a growth supplement to the *N. crassa* mutant,

tryp-1-13. 74 % conversion. Sp. act. : 2.7 × 10⁵ c.p.m./μmole.

65-458

ZEITLER, H. J.

5-Hydroxyanthranilic-carboxy-¹⁴C acid as bacterial growth substance.

Z. Physiol. Chem. **340**, 73 (1965).

CA **63**, 5553 h (1965)

Nitraniline, diazotation + KCN-¹⁴C/CuCN, sapon., hydrogenation → anthranilic acid, → corresp. diazonium tribromide → azido compd. → title compd. Total yield : 29 %.

See also : **65-495**, 2,4,6-Tri-tert-butylphenoxy-¹³C.

1.2.4 — HETEROCYCLIC COMPOUNDS

65-459

AUGUSTI-TOCCO, G., BROWN, G. L.

Reaction of N-cyclohexyl-N'-(β-(4-(methylmorpholino)-ethyl)-carbodiimide iodide (I) with nucleic acids and polynucleotides.

Nature **206**, 683 (1965)

CA **63**, 4553c (1965)

I labeled with ¹⁴C in the 4-Me group was prepd. by treating methyl-¹⁴C iodide with excess morpholinocyclohexylcarbodiimide at room temp. for 15 hrs.

65-460

FILIPPI, J., GUERN, J.

Synthèses de la benzylamino-6 purine marquée au ¹⁴C.

Bull. Soc. Chim. France **1965**, 2617.

Adenine-8-¹⁴C + benzoylchloride → 6-benzoylamino-purine, + LiAlH₄ → 6-benzylamino-purine-8-¹⁴C, purified by paper chrom. (3 times) in a yield of 71 %, sp. act. : 2 mCi/mmole.

Benzylamine-α-¹⁴C and 6-chloropurine gave the title compd. in a yield of 81 %, sp. act. : 0,4 mCi/mmole.

65-461

GROSS, D., FEIGE, A.,
SCHUETTE, H. R.

Synthesis of radioactively labeled compounds. XII. Synthesis of nicotinic acid (4,6-¹⁴C) and N-methyl-3-carboxy-6-piperidone-(4,6-¹⁴C).

Z. Chem. **5**, 21 (1965)

N. S. A. **19**, 28430 (1965)

Quinoline-(2,4-¹⁴C) by the Skraup synthesis from glycerine-(1,3-¹⁴C), oxidn. with Se, methylation with (CH₃)₂SO₄ → trigonellin sulfate, + K₃Fe(CN)₆, hydrogenation with Pt(PtO₂) → piperidone deriv.

65-462

ISHIGURO, I., LINZEN, B.

Preparative isolation and tritium-labeling of 3-hydroxy-L-kynurenine.

Z. Physiol. Chem. **340**, 286 (1965)

CA **63**, 11898h (1965)

Isolation from Calliphora pupae. Heating in vacuo for 2 hrs. in a tube with NHCl contg. ³H.

See also : 65-452, Thenylmagnesium chloride and ¹⁴CO₂.

1.2.5 — ALKALOIDS

65-463

JOHNE, S., GROEGER, D.

Synthesis of radioactively labeled compounds. XIII. Synthesis of 9-pegene-1,2,3,10-¹⁴C (deoxyvasicine-1,2,3,10-¹⁴C).

Z. Chem. **5**, 228 (1965)

CA **63**, 8431 (1965)

The title compd. directly from proline-¹⁴C, o-NH₂BzH and NaIO₃ (pH 2) and subsequent hydrogenation (Pd-BaSO₄).

65-464

SCHMIDT, H. L., WERNER, G.,
KUMPE G.

Synthetischer Einbau von ¹⁴C in (-)-Scopolamin, Scopin und Scopolin.

Ann. Chemie **688**, 228 (1965).

Scopolamine → nor(-)-scopolamine, + ¹⁴CH₃I → (-)-scopolamine-(N-¹⁴CH₃) (I), total yield 67,5 %, sp. act. : 25,4 mCi/mmole. Enzymatical hydrolysis of I → scopine-(N-¹⁴CH₃); I and NaOH → scopoline-(N-¹⁴CH₃).

1.2.6 — AMINO ACIDS,
PEPTIDES, PROTEINS

65-465

EGYED, J., MEISEL, T.

New methods for the production of ¹⁴C-labeled amino acids. I. Synthesis of DL-alanine-1-¹⁴C.

Magy Tud. Akad. Kozp. Kem. Kut. Int. Kozlemen. **1963**, 29 and 35.

CA **62**, 11903e (1965)

Starting material : phthaloyl deriv. of the nonradioactive amino acid. Conversion into the corresp. acyl azide; Curtius degradation, displacement of the phthaloyl group by K¹⁴CN and acidic hydrolysis → title compd. (69.2 %, sp. act. 81 mCi/mole). Similarly, DL-valine-1-¹⁴C and DL-phenylalanine-1-¹⁴C, sp. act. 24.8 and 26.9 mCi/mole, resp. are obtained.

65-466

FALECKI, J., PLEJEWSKI, R.

Synthesis of glutamic acid-¹⁴CO₂H.

J. Prakt. Chem. **28**, 123 (1965)

CA **63**, 5736e (1965)

Ethylene oxide + Na¹⁴CN, + HBr → 74-80 % BrCH₂CH₂-¹⁴CO₂H, + CH₂N₂ → Me ester, + diethyl phthalamidomalonaate → → title compd.

65-467

GROVES, T. D. D., LARSON, B. L.

Preparation of specifically labeled milk proteins using bovine mammary-cell cultures.

Biochim. Biophys. Acta **104**, 462 (1965)

β-Lactoglobulin and α-lactalbumin were prepd. by incubating in vitro cultures of bovine mammary secretory cells with either DL-(4,5-³H)-lysine or -leucine or L-lysine-

U-¹⁴C or L-leucine-U-¹⁴C. Sp. activities in the range of 2.19×10^2 to 2.33×10^6 (for T) d.p.m./mg after addn. of carrier.

65-468

SANGSTER, A. N., POORT, C.

Algal protein hydrolyzate ; its suitability as a source of protein precursors.

Biochem. Biophys. Res. Commun. **20**, 218 (1965)

CA **63**, 10203h (1965)

With ¹⁴C-labeled algal protein hydrolyzate high incorporation of radioactivity in the protein fraction of rat pancreas pieces and microsomes, most of it caused by the labeled impurities of ¹⁴C-labeled protein hydrolyzate, demonstrated with isotope diln. and by the fact that leucine-¹⁴C was scarcely incorporated under the same conditions.

1.2.7 — CARBOHYDRATES

65-469

CANDY, D. J., BADDILEY, J.

The biosynthesis of streptomycin. The origin of the C-formyl group of streptose.

Biochem. J. **96**, 526 (1965)

Starting from (1,3-¹⁴C)glycerol (51 μCi/mg) D-(1,3-¹⁴C)glucose was prepd. by a series of enzymic reactions (addn. of glyceraldehyde-3-phosphate); 30 % of the total radioactivity corresponded to glucose. Proof of labeling pattern by degradn. 2 % contamination at C4-6.

65-470

LORANT, M.

Radioactive sugars.

Chem. Rundschau **17**, 19 (1964)

CA **63**, 8465a (1965)

The U. S. National Bureau of Standards has prepd. D-glucose-, D-mannose-, D-galactose-, D-arabinose-, D-ribose- and lactose-1-¹⁴C, mannitol-, and D-fructose-1,6-¹⁴C, D-arabinose-5-¹⁴C, D-glucose-, glucitol-, and L-sorbose-6-¹⁴C. Revised semi-micro synthesis produced better yields.

65-471

NIKAIDO, H.

Biosynthesis of cell wall polysaccharide in mutant strains of Salmonella. III. Transfer of L-rhamnose and D-galactose.

Biochemistry **4**, 1550 (1965)

Glucose-1-¹⁴C-6-phosphate → thymidine diphosphate (TDP) glucose (enzym.) → TDP-rhamnose-1-¹⁴C, enzym.

65-472

RENZ, P.

Biosyntheses in the cobalamin series. VII. Microbial conversion of cobalamine analogs into vitamin B₁₂.

Angew. Chem. **77**, 547 (1965)

CA **63**, 8651g (1965)

¹⁴C-Labeled benzimidazolecobamide from ¹⁴C-labeled D-glucose, cobinamide, and benzimidazole, using P. Shermanii. Cerium degradation demonstrated that all the radioactivity was in the ribose portion.

65-473

SZABOLCS, A., GRUBER, L., OETVOES, L.

Synthesis of 1,6-bis-(β-chloroethyl-¹⁴C₁-amino)-1,6-dideoxy-D-mannitol dihydrochloride (degranol-¹⁴C).

Acta Chim. Acad. Sci. Hung. **43**, 159 (1965)

N. S. A. **19**, 34207 (1965)

The title compd. labeled in the chloroethyl-amino groups from 1,2-5,6-dianhydro-3,4-isopropylidene-D-mannitol and ethylene-¹⁴C-imine.

65-474

WARD, C., WRIGHT, B. E.

Cell-wall synthesis in Dictyostelium discoideum. I. In vitro synthesis from uridine diphosphoglucose.

Biochemistry **4**, 2021 (1965)

Uridine diphospho(¹⁴C)glucose (I) from α-D-glucose-U-¹⁴C (II, 200 mCi/mmmole), ATP, hexokinase, and mutase → G-1-P and G-6-P, heat inactivation, incubation of the (¹⁴C)G-1-P with UTP, UDPG yeast

pyrophosphorylase added to the same reaction vessel \rightarrow I, 59 % over-all yield from II.

65-475

WRIGHT, A., ROBBINS, P. W.

The enzymatic synthesis of uridine diphosphate (¹⁴C)glucose.

Biochim. Biophys. Acta **104**, 594 (1965)

The enzyme fraction from yeast contains glucosephosphate isomerase, hexokinase and phosphoglucomutase + a high level of UDP glucose pyrophosphorylase. Glucose and fructose are converted to UDP glucose (I) via glucose 1-phosphate in a single incubation in the presence of phosphoglyceric acid, magnesium ions and UTP. Yield of purified I from 70-80 % of theory based on incubated glucose-fructose. When stored at -20° I is stable for several weeks.

1.2.8 — STEROIDS**65-476**

LETTRE, H.

Production of 6-azacholesterin (I) labeled with ¹⁴C in the C-4 or C-26 position.

EUR **2450.d** (1965)

Cholesterin-4-(and-26-¹⁴C) acetate, ozonolysis, + piperidine \rightarrow 3 β -acetoxy-5,6-secocholestane-5-one acid \rightarrow acylchloride \rightarrow azide, \rightarrow isocyanate, hydrogenation \rightarrow 3 β -acetoxy-6-aza-cholestane, + hypochloric acid, + KOH \rightarrow title compd. in 1.55 % and 1.94 % total yield respect. Tritiation of I by the Wilzbach method yielded only 10 %.

See also : **65-433**, Steroids-¹⁴C.

65-435, Pregn-4-en-3-one-4-¹⁴C,
20 α -hydroxy.

1.3 — Halogen Labelled Compounds**65-477**

KATSANOS, N. A.

Post-irradiation reactions in neutron-irradiated liquid bromobenzene.

J. Chem. Soc. **1965**, 4751

By following the reaction very soon after the end of the irradiation, values of total organic retention of ⁸²Br in pure bromobenzene as low as 23.3 % could be detected, the corresponding value for Ph⁸²Br being 7.5 %. These retentions increased to 66.7 and 29.6 %, respectively, after keeping for 1 hr. at 50°. In most cases, the reaction follows second-order kinetics with respect to a fraction of the inorganic ⁸²Br concentration. Removal of irreproducibility in bromobenzene experiments, widely reported in the literature, is pointed out.

65-478

LEMIEUX, R. U., HAYAMI, Jun-Ichi

The mechanism of the anomerization of the tetra-O-acetyl-D-glucopyranosyl chlorides.

Can. J. Chem. **43**, 2162 (1965)

Tetra-O-acetyl- β -D-glucopyranosyl chloride-³⁶Cl by exchange of the corresp. α -bromide with tetraethyl-ammonium chloride-³⁶Cl at 30°, sp. act. 5.05 c.p.m./mmole. The α -anomer was prepared as above with anomerisation of the initially built β -anomer at 100° for 90 min.

65-479

OSTMAN, B.

Secondary α -deuterium isotope effects and relative rates in the halogen exchange reactions of benzyl and thenyl chlorides.

J. Am. Chem. Soc. **87**, 3163 (1965)

Benzyl chloride- α -d₂ or 2-thenyl chloride- α -d₂ were treated with Li³⁶Cl in DMF at 50° for 60 hrs., 60 % of chlorine-labeled products.

65-480

ATKINS, D. H. F., ARKELL, G. M.

The preparation of radioiodine labeled methyl iodide by an exchange process.

AERE-R **4823**, June 1965

Technique for the preparation of methyl iodide labeled with iodine-131 or -132 by an exchange reaction. Isolation by gas chromatography. Reaction kinetic.

65-481

MITT, A. E. A., CAMIN, L. L.

Preparation of compounds tagged with ^{131}I in the C. N. E. A. of the Argentine Republic.

Arg. Rep., Com. Nacl. Energia At., Inform. N^o 143, 12 pp. (1965)

CA 63, 7833c (1965)

Brief descriptions of the methods used and the annual amts. produced since 1961 are given.

65-482

MIALE, A. Jr.

Measurement of radioiodinated albumin-metabolism in man. I. General considerations.

Serum Proteins Dysproteinemias 1964, 307

CA 63, 7417d (1965)

A review with 49 references.

65-483

MIALE, A. Jr, BRODINE, C. E., VERTREES, K.

Measurement of radioiodinated albumin metabolism in man. II. Radioiodination of human serum albumin.

Serum Proteins Dysproteinemias 1964, 319

CA 63, 7417d (1965)

A review with 9 references.

65-484

BANERJEE, R. N.

Insulin labeled with radioactive iodine; preparation, purification, and hormonal properties.

J. Endocrinol. 33, 109 (1965)

CA 63, 10267f (1965)

Modification of the Conway microdiffusion unit. 2.5 γ Insulin and 1 γ KI with 3-5 mCi Na^{131}I , oxidn. by $\text{K}_2\text{Cr}_2\text{O}_7$, 1 hr., 25 % ^{131}I -incorporation, sp. act. 100-300 mCi/mg; 2nd technique : insulin, ^{131}I in NaOH, chloramine-T, 1 min., Na metabisulfite; 60-75 % incorporation, sp. act. 1000 mCi/mg. The av. fraction of product damaged was 35 %, compared to 10-15 % with the microdiffusion method. Purifn. on a Sephadex G-75 column. Chromato-electrophoresis after 14 days storage at 4^o showed little loss. No differences between the

labeled and unlabeled insulins in bioassay and immunol. studies.

65-485

OCHI, Y.

Studies on ^{131}I -labeled TSH : the inactivation of TSH by elemental iodine.

Endocrinol. Japon. 11, 275 (1964)

CA 63, 7287g (1965)

TSH was iodinated with various amts. of iodine. Biol. activity decreased progressively with TSH contg. increasing amts. of I, and fully iodinated TSH was completely inactive. Paper-chromatographic analysis revealed that the tyrosine residue of TSH was converted to mono- and (or) diiodotyrosine by iodination.

65-486

OCKLITZ, H.-W., HERZMANN, H., WEPPE, Ch. M.

Model studies with radionuclide labeling of antibodies against Bordetella pertussis.

Z. Immunitaetsforsch. 127, 428 (1964)

N. S. A. 19, 34096 (1965)

^{131}I , 7 mCi was incubated with rabbit γ -globulin for 2 hrs. at 37 $^{\circ}\text{C}$. The labeled anti-Bordetella pertussis globulin that resulted had a concentration of 0.276 mCi/ml of solution, and there were 6×10^{15} globulin molecules present in each 0.1 ml of the solution. They could be separated readily from the bacterial agglutinate if the paper was pretreated with human globulin.

65-487

ROSA, U., DONATO, L., AMBROSINO, C., PENNISI, F., MASSAGLIA, A., SCASSELLATI, G.

Electrochemical labeling of proteins.

EUR 2476.i (1965)

Preparation of radioiodide-labeled human serum albumin and insulin. Data on the apparatus, techniques, and control of the end product. Study of the effects of iodination (e.g. electrophoretic mobility, the catabolic rate, convulsive and hypoglycemic activity). Distribution of the iodine in the residual tyrosine (see also 65-144 and 65-317).

See also : 65-506, Di- and Triiodotyrosine.

1.4 — Phosphorus-32 Compounds

65-488

SASTRY, P. S., KATES, M.

Biosynthesis of lipids in plants. I. Incorporation of orthophosphate-³²P and glycerophosphate-³²P into phosphatides of *Chlorella vulgaris* during photosynthesis.

Can. J. Biochem. **43**, 1445 (1965)

Phosphoric acid-³²P, H₂O-free + DL-acetone glycerol, 16 hrs., 140°, sapon. with 0.2N sulfuric acid, pptn. of glycerophosphate-³²P as Ba-salt; yield : 2 %, sp. act. 4.5 μ Ci/ μ mole.

65-489

SHAFIEV, A. I., GABOV, N. I.

Phosphorus-32-labeled phosphoric acid esters.

U.S.S.R. **170**, 980, May 11, 1965, Appl. Oct. 14, 1963

CA **63**, 9812b (1965)

The title compds. are prepd. by irradiating with fast neutrons the target, contg. CCl₄ and a small amt. of alc., placed in a closed container.

See also : 65-402, 0,0-Dimethyl S-(methyl-carbamoyl methyl)phosphorodithioate-³²P.

1.5 — Sulphur-35 Compounds

65-490

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

Method of hot synthesis of biologically active compounds, derivatives of sulfur-35. I. Interaction of ³⁵S atoms with 4-methyl-5 β -hydroxythiazole.

Radiokhim. Metody Opred. Mikroelementov, Akad. Nauk. SSSR. Sb. Statei **1965**, 185.

CA **63**, 8338a (1965)

By irradiation of 4-methyl-5-(β -hydroxyethyl)thiazole (I) in CCl₄ (~39 mole-%)-C₆H₆ and utilizing the reaction ³⁵Cl-(n,p)³⁵S, I-³⁵S was prepd.

65-491

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

Method of hot synthesis of biologically active compounds, derivatives of sulphur-35. II. Interaction of ³⁵S with some amino acids.

Radiokhim. Metody Opred. Mikroelementov. Akad. Nauk. SSSR, Sb. Statei **1965**, 187.

CA **63**, 8478b (1965) (see also CA **63**, 10946h)

Reactions of ³⁵S with methionine, norvaline, and norleucine. By-products : sulfoxides and sulfones.

65-492

FOJTIK, A., SPURNY, Z., BRDICKA, R.

New approach to the preparation of ³⁵S-labeled cystine.

Collection Czech. Chem. Commun. **30**, 892 (1965)

CA **62**, 12125d (1965)

Neutron irradiation of cystine \rightarrow labeled cysteine, reoxidation with cystine disulfide. Yield based on the original sample about 15 %, sp. act. 1.08×10^{-2} mCi/g.

65-493

KRONRAD, L.

Preparation of mustard gas-³⁵S.

(UJV-1118/64) Jan. 1965

N. S. A. **19**, 32188 (1965)

Na₂³⁵S \cdot 9H₂O + ethylene chlorohydrin \rightarrow β,β' -thiodiglycol-³⁵S, + thionyl chloride \rightarrow β,β' -dichlorodiethyl sulfide-³⁵S, sp. act. 5 to 30 mCi/mmole.

65-494

MITRA, S. K., MANDAL, R. K., BURMA, D. P.

A biosynthetic method for preparing ³⁵S-labeled lipoic acid.

Biochim. Biophys. Acta **107**, 131 (1965)

Azotobacter vinelandii, S-deficient medium, addition of carrier-free ³⁵SO₄²⁻. Pptn. with trichloroacetic acid, extn. with benzene, purifn. by paper chromatography.

1.6 — Oxygen-18 Compounds**65-495**

RIEKER, A., SCHEFFLER, K.

Spin density distribution in free radicals. II. ^{17}O -Hyperfine structure of labeled ^{17}O -2,4,6-tri-tert-butyl-phenoxy.Tetrahedron Letters **1963** (19), 1337N. S. A. **19**, 36445 (1965)Prepn. of 1- ^{13}C -2,4,6-tri-tert-butyl-phenoxy and ^{17}O -2,4,6-tri-tert-butyl-phenoxy.See also : **65-380**, 0-18 labeling for man spectrom. via GLC.**1.7 — Nitrogen-15 Compounds****65-496**

KAWAZOE, Y., OHNISHI, M., KATAOKA, N.

Study on ^{15}N -H spin-spin coupling of 4-nitroquinoline 1-oxides containing deuterium and/or nitrogen-15.Chem. Pharm. Bull. (Tokyo), **13**, 396 (1965)N. S. A. **19**, 32192 (1965)Nitration of benzene (for 1- ^{15}N compds.) or quinoline 1-oxide (for 4- $^{15}\text{NO}_2$ compds.) with potassium nitrate- ^{15}N . Deuterium was substituted at various positions and in different degrees.**65-497**

WAHREN, M.

Compounds labeled with stable isotopes. II. Investigation of the Skraup quinoline synthesis with the help of ^{15}N .Tetrahedron **20**, 2773 (1964)N. S. A. **19**, 28429 (1965)Nitrobenzene- ^{15}N from benzene, $\text{Na}^{15}\text{NO}_3$, (8.1 % ^{15}N), \rightarrow aniline. Samples containing glycerine, and concentrated H_2SO_4 with either nitrobenzene or aniline labeled. Less than 2 % of the quinoline N comes from the nitrobenzene N. Thus unsubstituted nitrobenzene or m-nitrobenzenesulfonic acid may be used in the preparation of labeled substituted quinolines.**65-498**

NAKAMURA, A.

Infrared absorption spectra of DL-lysine monohydrochloride and dihydrochloride in relation to the ^{15}N isotope effect.Nippon Kagaku Zasshi **86**, 500 (1965)CA **63**, 7097h (1965)DL-Lysine- α - ^{15}N hydrochloride and DL-lysine- α , ϵ - $^{15}\text{N}_2$ hydrochloride were synthesized.**1.8 — Miscellaneous****2 — RADIODECOMPOSITION, STABILITY, STORAGE****65-499**

BAEYENS, W., CHARLES, P., DAVILA, C., HUART, R., LEDOUX, L., ZAMORANI, G.

Study of the conservation and stability of labeled macromolecules.EUR **2419.f** (1965)

1. The preparation, properties and storage of nucleic acids labeled by biological synthesis or by tritiation in vitro;
2. The study of the properties and storage of ribonuclease and lysozyme at high specific activity.

See **64-3P** and **28P** (EUR 1625.e).**65-500**

CIRANNI, G., GUARINO, A., PIZZELLA, R., POSSAGNO, E., RABE, B., RABE, G.

Self-radiolysis and methods for storage of tritiated organic compounds.EUR **2452.e** (1965)The following ^3H -labeled compds. were prepd. and stored under various conditions for different periods : cyclohexane, 2.952 mCi/mg. $G(\text{H}_2) = 4,3$, high yields of polymers; n-propanol, 2.272 mCi/mg. $G(\text{H}_2)$ in vacuo = 3.0, \rightarrow aldehydes, iso-

propanol and allyl alcohol but no glycols or polymers; methyl butyrate-2,3-³H and methyl stearate-9,10-³H, with rather high G-values; phenylalanine-³H.

65-501

HADDEN, D. R., PROUT, T. E.

Studies on human growth hormone. I. Radioiodination.

Bull. Johns Hopkins Hosp., **116**, 110 (1965)

N. S. A. **19**, 27926 (1965)

Radio-growth hormone of high radioactivity (138 $\mu\text{Ci}/\mu\text{g}$ HGH) became degraded in a relatively short period, probably as a result of self-radiation. Radio-growth hormone of low radioactivity (17.6 $\mu\text{Ci}/\mu\text{g}$ HGH) remained stable. (0.033 atoms of ¹³¹I per molecule of HGH).

65-502

HAIGH, W. G., HANAHAN, D. J.

The spontaneous degradation of a tritiated glyceryl ether.

Biochim. Biophys. Acta **98**, 640 (1965)

N. S. A. **19**, 34208 (1965)

Tritium labeled 1-O-hexadecyl glycerol was prepared and stored in benzene at -20°C . After 6 months most of the radioactivity was detected in compds. other than the labeled chimyl alcohol (T. L. C.): hydrocarbons were found to be the chief labeled breakdown product. The breakdown was retarded or eliminated by carbon tetrachloride.

65-503

KHARLAMOV, V. T.,
SHUBNYAKOVA, L. P.

The use of paper chromatography for the determination of the decomposition of methionine-³⁵S during storage.

Metody Analiza Radioaktivn. Preparatov. Sb. Statei **1965**, 58.

CA **63**, 10201f (1965)

Ascending technique, water as the solvent system. Samples with sp. act. 350 and 1170 mCi/g stored in N or in vacuo did not decomp. after 100 and 35 days, resp., while during storage in the air the resp. degrees of decompns. were 26 and 41 % (see also **65-52**).

65-504

SGOUTAS, D. S., KIM, M. J.,
KUMMEROW, F. A.

Radiohomogeneity of ³H- and ¹⁴C-labeled linoleic acid in vivo.

J. Lipid Res. **6**, 383-9 (1965)

CA **63**, 4772c (1965)

³H-labeled linoleic acid was biol. indistinguishable from the linoleic-¹⁴C acid.

See also : **65-484**, Insulin-¹³¹I

65-485, TSH-¹³¹I

65-512, Cysteine-³⁵S

65-517, Hydrocarbons-¹⁴C

65-522, Carnitine- and crotonobetaine-³H.

3 — PURIFICATION, SEPARATION

65-505

BAUMGAERTNER, G., SCHOEN, A.

Paper chromatographic separation of isomeric diiodobenzenes and activation analysis.

J. Chromatog. **13**, 266 (1964)

CA **63**, 4923d (1965)

Owing to the rapid isotopic exchange occurring under the conditions of gas chromatographic sepn. the compds. are sepd.

paper-chromatographically on a fully acetylated paper with MeOH-Me₂CO-H₂O (4 : 4 : 1).

65-506

SZANTAI, I., URAY, Z., KOVACS, V.
Isotopic exchange between iodinated amino acids and ¹³¹I, on chromatographic paper.

Studii Cercetari Biochim. **8**, 81 (1965)

CA **63**, 10302e (1965)

Direct isotopic exchange on chromatographic paper between ^{131}I and tyrosine, di- and triiodotyrosine and histidine. This is important for the identification of isotopic thyroid compds., iodinated with ^{131}I . The same behavior is shown by the BuOH exts. of thyroid compds., labeled with ^{131}I , towards inactive tracers used in the process of extn.

65-507

BENRAAD, Th. J.,
KLOPPENBORG, P. W. C.

Double isotope assay of aldosterone in urinary extracts with the combined use of thin-layer and paper chromatography.

Clin. Chim. Acta **12**, 565 (1965)

Addition of aldosterone- ^3H , TLC, acetylation with acetic anhydride- ^{14}C , TLC, paper chrom. Insignificant systematic decrease of the $^3\text{H} : ^{14}\text{C}$ ratio on paper chrom.

65-508

BROWN, D. W., PHELPS, N. J.,
PALMER, D. L.

Purification of radioactive sodium o-iodohippurate using gel filtration with DEAE-Sephadex.

J. Nucl. Med. **6**, 287 (1965)

CA **63**, 11920h (1965)

Glass column 20×1.3 cm filled with A25 coarse DEAE-Sephadex. Contaminants come through at once, then o-iodohippurate and free ^{131}I .

65-509

HUGHES-JONES, N. C.

Iodine-125-labeled L chains of human blood group antibodies.

Nature **207**, 989 (1965)

Comparison between the electrophoretic mobility of ^{125}I -labeled L chains and unlabeled L chains obtained from pooled IgG globulin. The iodine-125 was found to be distributed in ten « peaks » of activity, each peak corresponding to the « minor » bands seen on staining which had moved further towards the positive pole than their corresponding « major » components.

65-510

KHARLAMOV, V. T.,
KHUSNUTDINOVA, Z. S.

Study of the radiochemical composition of halogen derivatives of fluorescein, labeled with iodine-131, and their determination.

Metody Analiza Radioaktivn. Preparatov. Sb. Statei **1965**, 17

CA **63**, 11257d (1965)

Rose Bengal and diiodofluorescein, paper chromatography and spectrophotometry. Required vol. of samples : 0.1 ml with 0.5-5 mCi/ml activity.

65-511

KHARLAMOV, V. T.,
SHUBNYAKOVA, L. P.

Comparison of the properties of chromatography papers used for the analysis of labeled preparations.

Metody Analiza Radioaktivn. Preparatov. Sb. Statei **1965**, 128.

CA **63**, 10647g (1965)

Three sorts of chromatography papers were tested with β -phenyl- α -alanine- ^{14}C and methionine- ^{35}S for impurities that disturb the spectrophotometrical analysis.

65-512

KHUSNUTDINOVA, Z. S.

Method for the analysis of ^{35}S -labeled cysteine.

Metody Analiza Radioaktivn. Preparatov. Sb. Statei **1965**, 148

CA **63**, 11985 C (1965)

Spectrophotometric absorption of the Pb complex, purified by paper chromatography. The alteration of the prepn. in the course of several months was investigated.

65-513

SYSOEVA, E. S., KHARLAMOV, V. T.,
SHUBNYAKOVA, L. P.

Analysis of the adenine and adenosine samples labeled with ^{14}C .

Metody Analiza Radioaktivn. Preparatov. Sb. Statei **1965**, 75

CA 63, 11982d (1965)

For the detn. of radiochem. compn. best sepn. by paper chromatography with the use of 5 % soln. of Na_2HPO_4 satd. with isoamyl alc. during 5-7 hrs. The R_F value of adenine- ^{14}C is 0.44, that of adenosine 0.54. Quant. elution in 15 min. at 50-60° with 0.1N soln. of HCl.

65-514

WENZEL, M., JOEL, I.,
SULLIVAN, T. F.

Zur Aminosäure-Markierung in Tumorzellen nach Intrazellulärer DPN- ^3H -Herstellung. Addendum : synthesis of DL-sodium lactate- $2\text{-}^3\text{H}$.

Naturwissenschaften 52, 565 (1965)

TLC analysis on silica gel G from n-butanol : acetic acid : water of DL-sodium lactate- $2\text{-}^3\text{H}$ from ethyl pyruvate and NaBT_4 showed the redn. product to consist of two components which could be separated by paper chrom.

65-515

YOUNG, R. W., FULHORST, H. W.

Recovery of ^{35}S radioactivity from protein-bearing polyacrylamide gel.

Anal. Biochem 11, 389 (1965)

N. S. A. 19, 32067 (1965)

Recovery of ^{35}S -albumin in serum aliquots from mice injected with ^{35}S -L-methionine from polyacrylamide gel used in disk electrophoresis.

65-516

BRUNER, F., CARTONI, G. P.

Gas chromatographic separation of deuterated methanes.

J. Chromatog. 18, 390 (1965)

CA 63, 7648h (1965)

Sepn. of the 5 isomeric methanes on an adsorption glass capillary column; 0.30 mm \times 35 m; 55,000 theoretical plates.

65-517

MUHS, M. A., BASTIN, E. L.,
GORDON, B. E.

Purities of some commercially available ^{14}C -labeled hydrocarbons by gas-liquid radiochromatography.

Intern. J. Appl. Radiation Isotopes 16, 537 (1965).

A number of commercially available ^{14}C -labeled hydrocarbons had satisfactory chemical purity ($>99\%$) but poor radiochemical purities (0-50 %). Successful purifn. by preparative scale gas chromatography using GLRC as the test method. Two sources of impurities : first, during the synthesis step traces of comparable volatility but of higher sp. act. ; and second, during storage polymers by self-radiolysis.

65-518

KOSS, F. W., JERCHEL, D.

Thin-layer chromatography of radioactive materials.

Radiochim. Acta 3, 220 (1964).

CA 63, 3595c (1965)

A review with 53 references.

65-519

PORCELLATI, G.

The use of chromatographic procedures in the synthesis of ^{14}C -labeled phosphodiester.

J. Chromatog. 18, 168 (1965)

N. S. A. 19, 30218 (1965)

Ion-exchange and TL-chromatography in preparation of pure crystals of ^{14}C -labeled phosphodiester was found to be a simple, rapid method for purification.

65-520

SCHNEIDER, F. H., GILLIS, C. N.

Catechol amine biosynthesis in vitro. Application of the thin-layer chromatography.

Biochem. Pharmacol. 14, 623 (1965)

CA 63, 3256h (1965)

Best two-dimensional sepn. of T-labeled dopa, dopamine, and norepinephrine with 4 : 3 : 2 : 1 MeOH-BuOH- C_6H_6 - H_2O , followed by 180 : 180 : 1 : 39 Me_2CO - Me_3COH - HCO_2H - H_2O , each solvent contg. 0.01 % EDTA (Na salt).

65-521

TAYLOR, E. H.

Test for radiochemical purity of sodium radioiodide (^{131}I) solution U. S. P. by thin-layer chromatography.

J. Pharm. Sci. **54**, 639 (1965)N. S. A. **19**, 30120 (1965)

The plates used are prepared with silica gel G. Developing solvent is 75 % methanol, and time of development is about 40 min., the radioactive zones are scanned, the plates are then sprayed with a solution of ascorbic acid, then with starch (iodate), then with hydrogen peroxide (iodide).

65-522

VERLY, W.

Preparation and purification of tritiated geranylinalool.

EUR **2531.f** October 1965

Purification of geranylinalool, labeled by the Wilzbach method on silica gel according to Demole, does not give sufficient radiochemical purity. Tritiated carnitine and crotonobetaine, with sp. act. of 0.9 mCi/mmole have been kept without appreciable radiolysis at -20°C during 12 months.

See also : **65-396**, Sepn. of endo-exo isomers of norborneol-2-d

65-484, Insulin- ^{131}I **65-503**, Methionine- ^{35}S **65-523**, Electrophoresis of proteins- ^{14}C **65-525**, GLC for labeled compds.**65-527**, Neohydrin- ^{203}Hg , paper chrom.**65-529**, Methionine- ^{35}S and phenylalanine - ^{14}C paper chrom.**4 — ANALYSIS****4.1 — Substances****4.1.1 — DETERMINATION OF ACTIVITY****65-523**

FAIRBANKS, G. Jr., LEVINTHAL, C., REEDER, R. H.

Analysis of ^{14}C -labeled proteins by disc electrophoresis.

Biochem. Biophys. Res Commun. **20**, 393 (1965)

A large number of protein components in a complex mixture can be sepd. and detected in a single operation. Bands of ^{14}C -labeled proteins can be detected by autoradiography of dried longitudinal polyacrylamide gel slices.

65-524

HALL, T. C., COCKING, E. C.

High-efficiency liquid-scintillation counting of ^{14}C -labeled material in aqueous solution

and determination of specific activity of labeled proteins.

Biochem. J. **96**, 626 (1965)

Inexpensive scintillation mixtures are described which enable the detection of as little as 40 μCi of ^{14}C in aqueous solution with an efficiency of counting of over 80 % of alkaline, acidic and neutral solutions of up to 1 ml volume.

65-525

JAMES, A. T.

Methods for the detection and estimation of radioactive compounds separated by gas-liquid chromatography.

New Biochem. Separations 1964, 1

CA **63**, 4638c (1965)

27 references.

65-526

JONES, G. B.

Determination of the specific activity of

labeled blood glucose by liquid scintillation using glucose pentaacetate.

Anal. Biochem. **12**, 249 (1965)

CA **63**, 8721c (1965)

65-527

BURTSEVA, L. N., MIRKINA, N. N., SYSOEVA, E. S., KHARLAMOV, V. T.

The use of thin-layer chromatography on silica gel for the analysis of neohydrin labeled with ^{203}Hg .

Metody Analiza Radioaktivn. Preparatov. Sb. Statei **1965**, 121

CA **63**, 11979g (1965)

65-528

KHARLAMOV, V. T.
KHUSNUTDINOVA, Z. S.

Determination of cardiostyrene and o-iodohippurate labeled with ^{131}I .

Metody Analiza Radioaktivn. Preparatov. Sb. Statei **1965**, 68

CA **63**, 11987f (1965)

Radiochem. detn. of both labeled substances by paper electrophoresis followed by radioactivity counting.

65-529

KHARLAMOV, V. T.,
SHUBNYAKOVA, L. P.

Determination of labeled amino acids by chromatography on paper.

Metody Analiza Radioaktivn. Preparatov. Sb. Statei **1965**, 168

CA **63**, 10688d (1965)

β -Phenyl- α -alanine- ^{14}C and methionine- ^{35}S were investigated by electrophoresis and chromatography on paper. The errors in the detns. were $\leq \pm 5\%$.

See also : **65-512**, Cysteine- ^{35}S

65-513, Adenine- and adenosine- ^{14}C

65-547, Amino acids- ^{14}C .

4.1.2 — *DETERMINATION OF RADIOCHEMICAL PATTERN*

65-530

ANDREWS, P., HOUGH, L.,
PICKEN, J. M.

The biosynthesis of L-rhamnose of plum-leaf polysaccharides.

Biochem. J. **97**, 27 (1965)

Degradation scheme for L-rhamnose applicable to the detn. of ^{14}C -labeling in different carbon atoms on a 0.3 mmole scale.

65-531

LARSSON, A.

Enzymatic synthesis of deoxyribonucleotides. VII. Studies on the hydrogen transfer with tritiated water.

Biochemistry **4**, 1984 (1965)

Degradn. of deoxyribose 5-phosphate by treatment with deoxyribose aldolase and alcohol dehydrogenase \rightarrow hydrogens of positions 1 and 2 as ethanol, those of positions 3 to 5 as glyceraldehyde 3-phosphate. In a second degradn. oxidn. with bromine to deoxyribonic acid 5-phosphate, \rightarrow hydrogen in position 1.

65-532

CORNFORTH, J. W.,
CORNFORTH, R. H., DONNINGER, C.,
POPJAK, G., SHIMIZU, Y., ICHII, S.,
FORCHIELLI, E., CASPI, E.

The migration and elimination of hydrogen during biosynthesis of cholesterol from squalene.

J. Am. Chem. Soc. **87**, 3224

In cholesterol, biosynthetically from 4R-4- ^3H -2- ^{14}C -mevalonic acid, the T-content on C-17, C-20 and C-24 was determined by a combined enzymatic and chemical degradation (cleavage of the side chain by incubation with a corpus luteum prepn. to isocaproic acid, pregnenolone (I) and progesterone, oxidn. of I first with peroxytrifluoroacetic acid, and then with chromic acid).

65-533

GROS, E. G., LEETE, E.

Biosynthesis of plant steroids. II. The distribution of activity in digitoxigenin derived from mevalonic acid-2-¹⁴C.

J. Am. Chem. Soc. **87**, 3479 (1965)

The steroid moiety of digitoxigenin, has been degraded systematically. It is labeled only at C-1, C-7, and C-15.

65-534

LEETE, E., GREGORY, H., GROS, E. G.

Biosynthesis of plant steroids. I. The origin of the butenolide ring of digitoxigenin.

J. Am. Chem. Soc. **87**, 3475 (1965)

Degradn. of digitoxigenin to determine activity at C-20, C-21, C-22 and C-23 : 3-acetyldigitoxigenin, ozonisation, redn., hydrolysis → glycolic acid and 3β-acetoxy-14β,21-dihydroxy-5β-pregnan-20-one, periodate cleavage of the latter → formaldehyde and corresp. androstane-17β-carboxylic acid.

65-535

FLEEKER, J., BYERRUM, R. U.

The role of glycerol in the biosynthesis of the pyridine moiety of nicotine.

J. Biol. Chem. **240**, 4099 (1965)

Nicotine degradn. for the pyridine moiety : nicotinic acid, corresp. amide, N-oxide, + PCl₅ → 2-chloronicotinonitrile, corresp. 2-hydroxy compd. → 2-pyridone, hydrolysis, CH₃I, KOH/350° C → propionic and acetic acid.

65-536

LIEBMAN, A. A., MORSINGH, F., RAPOPORT, H.

Biosynthesis of nicotine in Nicotinia glutinosa from carbon-14 dioxide. Labeling pattern in the pyrrolidine ring.

J. Am. Chem. Soc. **87**, 4399 (1965)

Nicotine degradn. via N-benzoylnicotine, oxidn. with periodate-permanganate → N-benzoyl-N-methyl-β-alanine and nicotinic acid for detn. of activity in C-2' and C-5' as well as in either C-3' or C-4'.

65-537

WU, Pei-Hsing Lin, BYERRUM, R. U.

Studies on the biosynthesis of the pyrrolidine ring of nicotine.

Biochemistry **4**, 1628 (1965)

Fission of the pyrrolidine ring to yield oxalic acid, methylamine, and 3-pyridyl methyl ketone along with previously utilized degradations permitted assessment of ¹⁴C in each carbon of the ring.

65-538

YANG, K. S., GHOLSON, R. K., WALLER, G. R.

Studies on nicotine biosynthesis.

J. Am. Chem. Soc. **87**, 4184 (1965)

Aniline-U-¹⁴C + glycerol → quinoline, + H₂O₂ → quinolinic acid-2,3,7,8-¹⁴C, pyrolysis → nicotinic acid-2,3,7,14C. Nicotine (from labeled precursors) degradn. via nicotinic acid and biological conversion of the latter to ricinine by castor seedlings (10 % radiochem. yield); further intermediates : ricinic acid, dihydrocinic acid, oxidn. to oxalic acid and N-methyl-β-alanine.

65-539

LEETE, E., AHMAD, A., KOMPIS, I.

Biosynthesis of the Vinca alkaloids. I. Feeding experiments with tryptophan-2-¹⁴C and acetate-1-¹⁴C.

J. Am. Chem. Soc. **87**, 4168 (1965)

Systematic degradation of vindoline after incorporation of the title compds. for localisation of the activity (via a β-carboline deriv.).

65-540

SCHÜTTE, H. R., HINDORF, H.

Zur Biosynthese von Lupanin und Hydroxylupanin in Lupinus Angustifolius.

Ann. Chemie **685**, 187 (1965)

Lupanine and hydroxylupanine degradn. after application of lysine-2-¹⁴C and cadaverine-1,5-¹⁴C by reacting them with PhLi and oxidn. with KMnO₄(C-2), by hydrogenation to sparteine, oxidn. with K₃Fe(CN)₆, PhLi (C-17), by exhaustive oxidn. with CrO₃ (see 65-190).

65-541

SCHÜTTE, H. R., LEHFELDT, J.,
HINDORF, H.

**Biosynthese von Matrin in Sophora Tetrap-
tera.**

Ann. Chemie **685**, 194 (1965)

Combined degradative routes for a systematic detn. of radioactivity distribution in matrine after application of lysine-2-¹⁴C or cadaverine-1,5-¹⁴C.

See also : **65-401**, Linolenic acid-³H

65-403, 1,2-Hexadecanediol-1,3,
4-³H.

4.2 — Apparatus and Methods

65-542

BELOUSOV, A. I., FEOKTISTOV, P. N.,
KHARLAMOV, V. T.,
TSIMBALAEV, R. M.

**Apparatus for the automatic registration of
the distribution of radioactivity on paper
chromatograms.**

Metody Analiza Radioaktivn. Preparatov.
Sb. Statei **1965**, 138.

CA **63**, 11974h (1965)

The mech. part of the app. and the electronics are described in detail. Sheets of paper 300 mm × 25 mm were moved between 2 counters.

65-543

BERTHOLD, F.

**Recent methods for the automatic evaluation
of thin-layer and paper radiochromatograms.**

IAEA 1965. Preprint N°. SM-61/31

N. S. A. **19**, 32597 (1965)

Using a novel kind of gas flow detector, it is possible to measure all beta-emitters, including tritium, without contact with the probe.

65-544

DOBBS, H. E.

**Dispensing solutions for liquid scintillation
counting.**

(AERE-M-1574) Apr. 1965

N. S. A. **19**, 30514 (1965)

Four syringe techniques were investigated for dispensing radioactive volatile and nonvolatile organic liquids in regard to errors due to vapor losses.

65-545

KIRIN, I. S., GRACHEV, S. A.,
GUSEV, Yu. K., LEONOV, V. V.

**Measurement of the activities of components
of mixtures of organic compounds containing
¹⁴C.**

Radiokhim. Metody. Opred. Mikroelementov. Akad. Nauk. SSSR.

Sb. Statei **1965**, 200

CA **63**, 3603e (1965)

Seprn. of org. compds. contg. ¹⁴C on a column filled with INZ-600 grains of 40-60 mesh covered with dinonyl phthalate or tricyanoxypropane. Combustion to CO₂ in a CuO combustion tube kept at 700°.

65-546

PAUL, S. D., KRISHNAN, M. S.

**Preparation of samples for mass-spectro-
metric analysis of nitrogen-15.**

Indian J. Chem. **3**, 230 (1965)

N. S. A. **19**, 36282 (1965)

Complete removal of oxygen by copper strips, lower discharge voltage, and the elimination of the degassing step in the samples of nitric acid by a modified discharge method and a thermal decomposition method for the detn. of ¹⁵N.

65-547

SCHORMUELLER, J., STAN, H. J.

**Continuous measurement of mixtures of
¹⁴C-labelled amino acids with a scintillator
after separation on ion exchange columns.**

Z. Anal. Chem. **211**, 274 (1965)

CA **63**, 9060e (1965)

The single fractions are counted with a plastic scintillator between 2 photomultipliers. After counting the total amino acid is detd. with ninhydrin. All measurements are recorded continuously.

65-548

SIMON, H., MUELLHOFER, G.,
MEDINA, R.

A universal method for radio-gas-chromatography and for the fast determination of carbon-14 and/or tritium-labeled substances independent of other elements present.

IAEA 1965, Preprint No. SM-61/15

N. S. A. **19**, 32112 (1965)

Substances containing nitrogen, as amino or nitro groups; sulphur, as thioethers; fluorine, as an N-trifluoroacetyl amino acid; chlorine, bromine, and iodine and benzene, toluene, and water, etc. are cracked in a current of hydrogen gas in a reactor containing Zn and Ni on a support. A quick analysis of marked substances can also be obtained by direct injection into the reactor. The reproducibility and applicability is reported.

65-549

STRICKLER, H. S., NECHAJ, J.,
GRAUER, R. C.

Externally applied probe for scanning radioactivity in countercurrent distribution machines.

Anal. Biochem. **12**, 271 (1965)

CA **63**, 8710e (1965)

Semiautomated system, primarily used for localizing an internal standard of 1 μ Ci thyroxine-¹³¹I.

65-550

TYKVA, R., GRUENBERGER, D.

Automatic continuous measurement of ¹⁴C activity in fractions from chromatographic columns.

Chem. Listy **59**, 732 (1965)

CA **63**, 4918g (1965)

Photomultiplier, polyethylene tube filled with anthracene.

65-551

OKADA, S., TAMEMASA, O.

A new simple apparatus for tritium labeling by the Wilzbach method.

Radioisotopes (Tokyo) **14**, 42 (1965)

CA **63**, 10946f (1965)

The gas in the reservoir can be easily replaced and the stop-cock and joints greased while the gas is in the app.

65-552

ABELL, C. W., DIRKS, F. I.,
DELK, A. S., LOEB, L. A.

A comparison of several methods of assay of carbon-14 in protein.

Anal. Biochem. **11**, 170 (1965)

N. S. A. **19**, 32066 (1965)

65-553

APELGOT, S.

Measurement of radioactivity by scintillation in a liquid medium : biological uses.

EUR **2459.f** (1965)

For aqueous solutions or suspensions which are not miscible with conventional scintillating media, the use of a membrane support eliminates both this difficulty and in general the associated quenching phenomena also.

65-554

COOK, C. A., DANCER, G. H. C.

Measurement of the specific activity of respired carbon-14 dioxide as a method of health physics control.

RCC-R-178, May 1965

N. S. A. **19**, 36236 (1965)

Absorption into NaOH, release by the addition of an excess of lactic acid into a proportional counter. Limiting sensitivity : 3×10^{-8} μ Ci carbon-14 per mil carbon dioxide.

65-555

BLOOM, P. M., NELP, W. B.

A method for β counting of large samples of plasma by liquid scintillation.

J. Lab. Clin. Med. **65**, 1030 (1965)

CA **63**, 8722a (1965)

Liquid scintillator solvent contg. toluene, Hyamine chloride, and ethylene glycol monoethyl ether. In plasma samples T was counted with an efficiency of 9.2 % and ¹⁴C with 66 % efficiency.

65-556

VAVREJN, B., FRANC, Z.,
SVOBODOVA, J., TUREK, S.,
LIPOVSKA, M., FRANCOVA, V.,
HONDLIK, J.

Preparation of samples of biological material for liquid scintillation measurement of low-energy β -emitters.

Collection Czech. Chem. Commun. **30**, 2084 (1965)

Detn. of ^{14}C , ^{35}S , ^{32}P , ^{131}I , and ^3H in biol. material by heating the sample with formamide contg. 10-15 %, ethanolamine at 115°C for 6 hrs. Subsequent liquid scintillation counting.

65-557

FRANC, Z., SVOBODOVA, J.,
FRANCOVA, V., LIPOVSKA, M.,
HORESOVSKY, C.

Measurement of soft β -radiation in biological material with the aid of liquid scintillators. II. Determination of ^{14}C and ^3H by oxidation in oxygen atmosphere.

Collection Czech. Chem. Commun. **30**, 2875 (1965)

(See preced. abstr.) Modifications to known methods in order to simplify the equipment and to ensure exact determination of large numbers of samples.

65-558

KNOCHE, H. W., BELL, R. M.

Tritium assay by combustion with a novel oxygen train and liquid scintillation techniques.

Anal. Biochem. **12**, 49 (1965)

CA **63**, 4651e (1965)

Analysis of ^3H in biol. samples. The tube design permits oxidn. and simultaneous collection of tritiated water in 10 min. for samples weighing 600-800 mg. The recoveries and standard deviations of different groups ranged from 99.4 to 96.6 and 1.2 to 3.5 % resp.

65-559

TSURUFUJI, S., TAKAHASHI, A.,
UCHIDA, M., TAKAGI, K.

A combustion method for liquid scintillation counting of ^3H -labeled biological materials.

Radioisotopes (Tokyo) **14**, 146 (1965)

CA **63**, 10962b (1965)

Freeze-dried tissues + sucrose or filter paper (to make up a total wt. to 20 mg) + NiO were heated in a specially prepd. glass tube at $450\text{-}500^\circ$ for 5 hrs. The water formed was collected by cooling the other end of the tube in a dry ice-acetone bath for a total of 2-2.5 hrs., 97.5 % recovery.

65-560

TYE, R., ENGEL, J. D.

Liquid scintillation counting of carbon-14.

Anal. Chem. **37**, 1225 (1965)

Digestion in aqueous sodium hydroxide. Dispersions are stabilized by suspension upon Cab-O-Sil, in dioxane, naphthalene, toluene, the scintillators 2,5-diphenyloxazole and 1,4-bis-2-(5-phenyloxazolyl)-benzene, and a compound to prevent freezing. The counting efficiency is adequately independent of phase distribution.

65-561

TYKVA, R.

The simultaneous determination of ^3H and ^{14}C radioactivity in biological materials by means of an internal proportional gas counting tube.

IAEA 1965, Preprint No. SM-61/28

N. S. A. **19**, 32113 (1965)

65-562

WILSON, A. T., SPEDDING, D. J.

Detection of tritium on paper and thin-layer chromatograms.

J. Chromatog. **18**, 76 (1965)

N. S. A. **19**, 30114 (1965)

The techniques used are reviewed. A simple technique is described for small amounts of tritium-labeled compds.

See also : **65-382**, T-measurement, bibliography.

4.3 — Radiochem. Methods for Analysis of Complex Compounds

65-563

COHEN, Y., INGRAND, J.,
ROUSSELET, J. P.Measurement of colloidal ^{198}Au and ^{32}P present in the same sample.

IAEA 1965, Preprint No. SM-61/59

N. S. A. 19, 32100 (1965)

Measurement of the ^{198}Au and ^{32}P after establishing their respective electromagnetic spectral curves and selecting favorable peaks or simultaneous radioactivity measurements using a photomultiplier with two distinct amplitude discrimination thresholds which give different yields for the two emissions.

65-564

FIELD, E. O., DAWSON, K. B.,
GIBBS, J. E.Autoradiographic differentiation of tritium and another β -emitter by a combined color-coupling and double stripping-film technique.

Stain Technol. 40, 295 (1965)

CA 63, 10309b (1965)

Application of 2 layers of autoradiographic stripping film, sepd. by a thin layer of celloidin. The 1st layer (in contact with

the tissue) records predominantly the distribution of ^3H in the sample, the 2nd exclusively that of ^{14}C . The Ag grains in one layer are colored by dye-coupling, which enables the grains in the 2 layers to be differentiated without the need for sep. focussing.

65-565

LEVI, H.

The interpretation of autoradiograms, especially when using tritium as a tracer.

Scand. J. Haematol. 1, 138 (1964)

N. S. A. 19, 35928 (1965)

Limitations of the autoradiographic method using tritium as a tracer, are discussed.

65-566

SPENCER, R. P.

Detection and assay of compounds of biologic interest by use of radiohalogenation.

IAEA 1965, Preprint No. SM-61/48

N. S. A. 19, 32109 (1965)

Three possible approaches are discussed : exposure of the organic compound to a radioactive halogen and count directly; exposure of the sample to a stable halogen and then activate the material, and production of the radiohalogen directly on the chromatogram, as by the coupled reactions $^6\text{Li}(n,^4\text{He})^3\text{H}$, $^{18}\text{O}(^3\text{H},n)^{18}\text{F}$.

5 — MISCELLANEOUS

65-567

GREENLAW, R. H., STRAIN, W. H.

Radioisotopic agents.

Med. Radiography Phot. 40, Suppl., 82-106 (1964)

N. S. A. 19, 28194 (1965)

Agents used in medical diagnosis are listed according to application, with designation of each radioisotope, divided into radiochemical groups arranged alphabetically according to radioisotope, with the chemical formula together with the product or generic names, or the chemical name. In

a third table the agents themselves are arranged alphabetically and references are given. Standardization of the nomenclature of radioisotope agents by various international organizations is also considered.

65-568

ISLER, O., SCHUDEL, P.

Synthesis and labelling of carotenes and carotenoids.

Wiss. Veroeffentl. Deut. Ges. Ernaehrung No. 9, 54 (1963)

CA 63, 3005d (1965)

A review with 107 references.

65-569

KHARLAMOV, V. T.

Control of the quality of radioactive isotopes and of compounds labeled by them.

Metody Analiza Radioaktivn. Preparatov. Sb. Statei 1965, 5

CA 63, 10911b (1965)

Review with 18 references.

65-570

WARD, H. L.

Isotope techniques in the biological sciences.

TID-3512 (Suppl. 1), May 1965

N. S. A. 19, 25825 (1965)

Selected references to literature published from 1958 through 1963 on techniques and

instruments for using radioisotopes in biological studies. Author, isotope, and report number and availability indexes.

65-571

WASHINGTON, D. C.

Clinical radioisotope scanning techniques.

p. 237-64 of «Fundamental Nuclear Energy Research 1964» AEC 1964

N. S. A. 19, 34099 (1965)

Recent developments in the applications of radioisotopes in clinical diagnostic studies. Development for equipment for use in scanning. Discussion of a series of localizing agents.

See also : 65-382, Bibliography on T measurement.

ACETIC ACID - O¹⁸ 90%

CARBON DIOXIDE - O¹⁸ 90%

METHANOL - O¹⁷ 11%

PHENOL - O¹⁸ 68%

PHOSPHORUS OXYCHLORIDE - O¹⁸ 92%

POTASSIUM NITRATE - O¹⁸ 73%

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