

A B S T R A C T S S E C T I O N

In this section are given information on methods of synthesizing labelled compounds and related problems (analysis, purifying, radiodecomposition, storage). The references cover articles drawn from about 40 secondary 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 M.R.J. Lefort, Chemical Engineer and retrieved by the mechanized documentation system of the Centre of Information and Documentation (CID) of the Commission of the European Communities.

The work on this information project was started in May 1964 and interrupted for reasons beyond our control, after the last issue of 1966.

The gap between 1967 and 1971 will be filled by the publication of a supplement to the Journal containing about 2.500 references collected during that period. There will be extra-charge for this volume.

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1 - G E N E R A L

72-1

ANONYMOUS

Dynamic studies with radioisotopes in medicine.

Proc. Symp. Rotterdam, 31 Aug.- 4 Sept. 1970 - CONF 700833, STI/PUB-263

N.S.A. 25 (1971), 26567

The proceedings contain 70 papers dealing primarily with tracer techniques.

72-2

EMRICH, D.

Diagnosis of organ function in nuclear medicine.

Stuttgart, Georg Thieme-Verlag (1971), 379 pp.

N.S.A. 25 (1971), 26829

Instrumentation, preparation of radiopharmaceuticals, kinetics of radio-nuclides are included.

72-3

GIESE, K.A.

Development of isotope techniques in West Germany.

Atomwirt. Atomtech. 15 (1970), Dec., 564-6

N.S.A. 25 (1971), 21248

Preparation of labelled pharmaceuticals and biologicals and production of equipment for measuring and monitoring radioisotopes are discussed.

72-4

GRODZENSKII, D.E.

Isotopes in biology and medicine.

Atomizdat (1969), 208 pp.

N.S.A. 25 (1971), 21538

Production and use of radioisotopes and of measuring equipment are discussed.

72-5

LIN, S.

Service of nuclear medicine, organization and technical aspects.

Minerva Med. 60 (1969), 17 Oct., 4063-81

N.S.A. 25 (1971), 35156

Radiopharmaceuticals were discussed.

72-6

MELLI, G.

Scintigraphy of liver, spleen, and pancreas.

Minerva Med. Giuliana 8 (1968), Sept.-Oct., 381-5

N.S.A. 25 (1971), 11200

Instrumentation and radiopharmaceuticals useful in the scintigraphy of liver, spleen, and pancreas are discussed.

72-7

PAYNE, B.R., DINCER, T.

Nuclear techniques in hydrology.

Progress of Hydrology 1. New Developments in Hydrology (1969), 126-48

1st International Seminar for Hydrology Professors, Urbana, Ill. CONF 690726, Vol. I

N.S.A. 25 (1971), 2359

Nucleonic instruments, uses of artificially-injected radioisotope tracers, and the use of environmental isotope variations in waters of the hydrological cycle are briefly discussed.

72-8

PETERSEN, D.A., BOYD, R.E., LANE, E.A., MORRIS, J.D.

Radiopharmaceuticals in nuclear medicine.

At. Energy Aust. 13 (1970), July, 2-8

N.S.A. 25 (1971), 13519

Choice of radionuclides, diagnostic techniques, production, transport, safety and cost are reviewed.

72-9

RATHJE, W.

Advantages and limitations of diagnostic nuclear medicine. *Therapiewoche* 20 (1970), Sept., 2043-4, 2047-51

N.S.A. 25 (1971), 19037

Detection of bone defects with ^{85}Sr or $^{87\text{m}}\text{Sr}$, disturbance of bone metabolism (double-tracer technique ^{45}Ca - ^{47}Ca), lung embolies and bronchial carcinomas (^{131}I -albumen macroaggregate method) were briefly reviewed. Isotope labelling of hormones and neutron activation analysis were also discussed.

72-10

WAGNER, H.N.Jr.

Research and biomedical applications. *Trans. Amer. Nucl. Soc.* 13 (1970), Nov., 522
CONF-701102

N.S.A. 25 (1971), 4415

72-11

WAGNER, H.N.Jr.

Recent advances in diagnostic nuclear medicine.

A/CONF 49/P-92 (1971), 22 pp.
CONF-710901-42

N.S.A. 25 (1971), 37833

Progress in the field of diagnostic nuclear medicine is reported. The following topics are discussed: application of computers, organ scanning or imaging, development and use of new short-lived radioisotopes and new radiopharmaceuticals.

2 - S Y N T H E S I S

2.0 - GENERAL

72-12

ANONYMOUS

Reports of the Symposium on the new method for producing radioactive preparations, Warsaw, December 9-13, 1969.

CONF-691225, 525 pp.

N.S.A. 25 (1971), 29413

Fifty reports describe the technology and new methods of production of radioisotopes and labelled organic compounds in the USSR.

72-13

ERTEL, G.

Production and mutual delivery of isotopes, labelled compounds, and sealed radiation sources in COMECON member states.

Isotopenpraxis 6 (1970), July, 201-3

N.S.A. 25 (1971), 4128

The development of labelled compounds, radioactive isotopes and radiation sources produced in the COMECON member countries are reviewed.

72-14

HUPF, H.

Cyclotron produced radiopharmaceuticals: preparation.

Central Nervous System Investigation with Radionuclides. Charles C. Thomas (1971), 140-7

N.S.A. 25 (1971), 32473

The preparation of radiopharmaceuticals from cyclotron targets is described.

72-15

ROSA, U.

Radioisotope production in Italy.

Research Reactor Utilization, IAEA, Rome, 2 Feb. 1970, 2 (1970), 319-41
CONF-700204-14

N.S.A. 25 (1971), 29273

The evolution of the research programme in Italy on the preparation and properties of labelled proteins for metabolic studies is included. Data are also given about the production of radiopharmaceuticals in Italy in 1969.

72-16

TILBURY, R.S., MAMACOS, J.P., LAUGHLIN, J.S.

Initial experience with a 30-in isochronous cyclotron for medical use.

Uses of Cyclotrons in Chemistry, Metallurgy and Biology, Oxford, England (1970), 17644
CONF-690924

N.S.A. 25 (1971), 17644

Several methods were developed for the production of ^{18}F , ^{123}I , ^{121}I , ^{52}Fe , ^{48}Cr , ^{11}C , and gases labelled with ^{15}O , ^{13}N and ^{11}C .

72-17

WITCOPSKI, R.L., GNAU, T.

Generator-produced radiopharmaceuticals.

Central Nervous System Investigation with Radionuclides (1971), 103-24
CONF-700338

N.S.A. 25 (1971), 32471

The preparation of radiopharmaceuticals from generator-produced radionuclides is illustrated. Properties and products of radionuclides generators are reviewed.

2.1 - DEUTERIUM COMPOUNDS

2.1.0 - GENERAL

72-18

PISAREV, Yu.N., ZEL'VENSII, Ya.D., SHAL'GIN, V.A.

Oxygen and hydrogen isotope exchange in alcohols.

Isotopenpraxis 6 (1970), Oct., 365-8

N.S.A. 25 (1971), 12991

^{18}O -, T-, and D-substituted alcohols can be prepared by catalytic hydrogen and oxygen exchange in the temperature range 200 to 300°C in the presence of active coal AGN.

2.1.1 - ALIPHATIC COMPOUNDS

72-19

DI CORCIA, A., FRITZ, D., BRUNNER, F.

Use of high efficiency packed columns for gas-solid chromatography. III. Separation of deuterium substituted compounds.

J. Chromatogr. 53 (1970), 2 Dec.,

135-41

N.S.A. 25 (1971), 15751

Isotopic pairs : $\text{CH}_3\text{OH}-\text{CD}_3\text{OH}$
are separated by gas-solid
chromatography with columns packed
with graphitized carbon black.

72-20

PRYOR, W.A., STANLEY, J.P.

Reactions of the hydrogen atom in
solution. IV. Photolysis of
deuterated thiols.

J. Amer. Chem. Soc. 93 (1971), 24
Mar., 1412-18

N.S.A. 25 (1971), 26252

The reactions of organic hydrogen
donors with the hydrogen atoms pro-
duced by the photolysis of thiols
were studied by a new method using
deuterated thiols.

72-21

SAUNDERS, M., VOGEL, P.

Equilibrium deuterium isotope effects
in systems undergoing rapid re-
arrangements. Di-methyl-tert-butyl-
carbonium ion and cyclopentyl cation.

J. Amer. Chem. Soc. 93 (1971), 10,
2559-61

N.S.A. 25 (1971), 39506

Deuterium isotope effects in a mixture
of 2,2,3-trimethylbutyl-3-ium ion and
deuterated 1,1,1-trideuterio-2,2,3-tri-
methylbutyl-3-ium ion was investigated.

72-22

UEDA, T., HIROTA, K.

Application of microwave spectroscopy
to the self-exchange of deuterium in
propylene-3- d_1 catalyzed by group VIII
metals.

J. Phys. Chem. 74 (1970), 26 Nov.,
4216-21

N.S.A. 25 (1971), 8258

In this study, the reaction products,
the isotopic isomers of mono- and di-
deuterated propylene were determined
quantitatively by the microwave
spectroscopy.

72-23

WEXLER, S., POBO, L.G.

Ion cyclotron resonance studies of
ionic reactions in ethane and of
hydrogen exchange in $\text{D}_2-\text{C}_2\text{H}_6$ and
 $\text{H}_2-\text{C}_2\text{D}_6$ mixtures.

J. Amer. Chem. Soc. 93 (1971),
24 Mar., 1327-35

N.S.A. 25 (1971), 26249

The mechanisms of exchange of
hydrogen isotopes during the ionic
reactions that take place in D_2-
 C_2H_6 and $\text{H}_2-\text{C}_2\text{D}_6$ mixtures were
investigated with the technique of
ion cyclotron resonance spectro-
scopy.

72-24

YAMPOLSKII, Yu.P., MAKSELOV, Yu.V.,
NOVIKOV, N.P., LAVROVSKII, K.P.

Chemical action of laser radiation
on acetylene.

Khim. Vys. Energ. 4 (1970), May-
Jan., 283-4

N.S.A. 25 (1971), 4070

Neodymium laser radiation of C_2D_2 ,
 C_2H_2 and equimolar mixture of
 C_2H_2 and C_2D_2 . The irradiation of
 C_2D_2 yielded chiefly ethane, the
irradiation of C_2H_2 , ethylene, and
the irradiation of $\text{C}_2\text{H}_2-\text{C}_2\text{D}_2$ gave
 C_2HD .

2.1.2 - AROMATIC COMPOUNDS

72-25

ATKINSON, J.G., LUKE, M.O.

Hydrogen-deuterium exchange of
medium ring cycloalkenes during
deuterogenation with tris(tri-
phenyl-phosphine)chlororhodium(I).

Can. J. Chem. 48 (1970), 15 Nov.,
3580-2

N.S.A. 25 (1971), 10539

The deuteration of cycloalkenes in presence of tris(triphenylphosphine)chlororhodium was studied. Cyclooctene, cycloheptene and cyclo-dodecene undergo H-D scrambling, whereas cyclohexene and 1-octene are deuterated by simple addition.

72-26

DeROSSET, A.J., PADRTA, F.G.

Benzene-deuteroyl exchange over deuterated γ -alumina.J. Catal. 19 (1970), Oct., 49-54N.S.A. 25 (1971), 2164

The kinetics of the exchange reaction between benzene and a large excess of deuteroyl or deuterated γ -alumina were first order in absorbed benzene but approached zero order in total benzene when tested in the saturation portion of the adsorption isotherm.

72-27

JONES, L.B., FOSTER, J.P.

Electronic effects in solvolysis reactions. III. Solvolysis of allyl-substituted cumyl derivatives.

J. Org. Chem. 35 (1970), 6, 1777-81C.A. 73 (1970), 13981

The preparation of p- γ -dideuterio-allylcumyl p-nitrobenzoates is described.

72-28

KINGSTON, D.G.I., HENION, J.D.

Hydrogen randomization in phenyl azide.

Org. Mass Spectrom. 3 (1970), 3, 413-4C.A. 73 (1970), 24739

H-D randomization was observed in the decomposition of phenyl-2,4,6-d₃ azide before the loss of HCN and C₂H₂.

72-29

KLEIN, J.D., BRENNER, S.

Metalation reactions. VI. Rearrangement of a propargylic anion.

Tetrahedron 26 (1970), 10, 2345-52
C.A. 73 (1970), 35426

3-Phenylpropyne-d₂ was obtained by dimetalation of 1-phenylpropyne with BuLi followed by deuteration.

72-30

LEE, C.C., HAHN, B.S., LAM, L.K.M., WOODCOCK, D.J.

Some observations on isotopic scramblings accompanying aceto-lysis in the 2-norbornyl system.

Can. J. Chem. 48 (1970), 15 Dec., 3831-9N.S.A. 25 (1971), 23576

It is shown that in the acetolysis of isotopically labelled oxo- or endo-2-norbornyl brosylate in NaOAc buffered HOAc, the initially formed product, exo-1-OAc, could undergo further isotopic scrambling during its subsequent contact with the reaction medium.

72-31

LEWIS, D.K.

Kinetics of the homogeneous bio-molecular isotope exchange re-actons

$$D_2 + CH_4 \rightarrow HD + CH_3D,$$

$$D_2 + H_2S \rightarrow HD + HDS \text{ and } HD + HD \rightarrow H_2 + D_2$$

as studied in single-pulse shock tubes.

Cornell Univ. (1970), 216 pp.
University Microfilms Order n° 70-17090N.S.A. 25 (1971) 12987

The title reactions were investigated under homogeneous conditions in single-pulse shock tubes.

72-32

LIGHTNER, D.A., QUISTAD, G.B., IRWIN, E.

Hydrogen rearrangements in the mass spectra of alkylbenzenes.

Appl. Spectroscopy 25 (1971), Mar.-Apr., 253-8N.S.A. 25 (1971), 29068

The γ -carbon is the principal site of transferred hydrogen (deuterium) regardless whether the hydrogen (deuterium) is primary, secondary or tertiary.

72-33

LILLIEN, I., HANDLOSER, L.

Steric factors in the cationic rearrangement of substituted cyclobutanes.

J. Amer. Chem. Soc. 93 (1971), Apr., 1682-93

N.S.A. 25 (1971), 29049

This study deals with the preparation of various 1-deuterated cyclobutane derivatives.

72-34

PHILIPSON, J.J., BURWELL, R.L.Jr.

Reaction between deuterium and cyclic olefins on platinum/alumina in the LHD phase.

J. Amer. Chem. Soc. 92 (1970), 21 Oct., 6125-33

N.S.A. 25 (1971), 107

Deuteration in the liquid phase of cyclopentene, cyclohexene, cycloheptene, cyclooctene, bicyclo[3.3.0]-2-octene, and 1-hexene on platinum/alumina are studied in various solvents: none, tetrahydrofuran (THF), THF + D₂O and others.

72-35

RATUSKY, J.

Reactions of salts of deuterated benzene carboxylic acids.

J. Label. Compounds 6 (1970), April-June, 124-34

During the transcarboxylation reactions of potassium salts of deuterated benzenecarboxylic acids, rapid random exchange of hydrogen atoms of the benzene ring for deuterium takes place.

72-36

SCHAPPELE, S.E., MILLER, D.W., GRIZZLE, P.L., MAUCERI, F.A.

Classical mechanical isotope effect. Effect of ring deuterium on the rate of pyrolysis of 1,1'-diphenylazo-

ethane.

J. Amer. Chem. Soc. 93 (1971), 19 May, 10, 2549-51

N.S.A. 25 (1971), 39502

The kinetic isotope effect in the decomposition of the ring-deuterated title compound was found to be essentially classical mechanical in origin.

72-37

SCHROEDER, L.R.

Acid-catalyzed [²H₆] ethanolyse of alkyl orthoacetates: evidence for keten dialkylacetals as intermediates.

J. Chem. Soc. B (1970), 9, 1789-94

N.S.A. 25 (1971), 6318

The deuterium exchange in 2,6-dichlorobenzoic acid catalyzed [²H₆] ethanolyse of 1,1,1-triethoxyethane and 2-ethoxy-2-methyl-1,3-dioxolan was studied by NMR and mass-spectral analysis.

72-38

SHINEK, V.J.Jr., FISHER, R.D.

α -Deuterium effects on the rates of solvolysis of a 2-adamantyl sulfonate ester.

J. Amer. Chem. Soc. 93 (1971), 10, 2553-4

N.S.A. 25 (1971), 39504

The α -deuterium isotope effect in the solvolysis of 2-adamantyl 2,2,2-trifluoroethylsulfonate is not dependent on solvent polarity or nucleophilicity in the range of 50% ethanol - 50% water to 97% 2,2,2-trifluoroethanol - 3% water.

72-39

SMITH, J.G.

A study of the exchange equilibria between methylacetylene-d and water by mass spectrometry and a study of the separation of the isotopic isomers of NO by low temperature gas chromatography.

Columbia Univ. (1970), 193 pp.

University Microfilms Order 71-6259

N.S.A. 25 (1971), 32062

The single stage enrichment factor, α , was measured for the base-catalyzed exchange of deuterium between methylacetylene and water as a function of temperature. Procedures for the analysis of the deuterated methylacetylene were used for analyses of water containing between 1 and 80 atom per cent deuterium.

72-40

WERSTIUK, N.H., MacDONALD, R.R.,
OUWENHAND, R.W.

Preparation and acetolysis of 5-deuterated exo-norbornyl-brosylates.

Tetrahedron Lett. 49 (1970), Oct.,
4363-6

N.S.A. 25 (1971), 2172

The exo-norbornyl-5-d-, exo-norbornyl-5,5-d₂-, and exo-norbornyl-6-endo-d-brosylates were prepared and solvolysed to check for nonbonded effects due to deuterium.

2.1.3 - HETEROCYCLIC COMPOUNDS

72-41

KLASINC, L., HUMSKI, K.

Molecular orbital calculations of the acid-catalyzed hydrogen exchange in substituted thiophenes.

Z. Naturforsch. B 25 (1970), 3,
324-5

C.A. 73 (1970), 13803

The relative H-D exchange rates in various positions of thiophene were calculated following a Hueckel Mo theory. The exchange rates obtained agree with available experimental data.

72-42

VAN LEAR, G.E.

Mass spectrometric studies of antibiotics. I. Mass spectra of mitomycin antibiotics.

Tetrahedron 26 (1970), 11, 2587-97

C.A. 73 (1970), 55285

In this study, the nature of major fragment ions from the aziridine

ring was established via D labeling.

72-43

YUNUSOV, S.Yu., RAZAKOV, R.

Structure of cocculine and cocculidine.

Khim. Prir. Soedin. 6 (1970), 1,
74-8

C.A. 73 (1970), 35585

Deuterococculine was studied and the fragmentation patterns are discussed.

2.1.4 - CARBOHYDRATES

2.1.5 - PEPTIDES, AMINO ACIDS, PROTEINS

72-44

FANG, S.M., RHODES, H.J.
BLAKE, M.I.

Deuterium isotopes effects in enzymatic transamination.

Biochem. Biophys. Acta 212 (1970),
Aug., 281-7

N.S.A. 25 (1971), 2168

L-2-²H-glutamic acid and L-[3,3,4,4-²H₄] glutamic acid were synthesized from L-glutamic acid and L-[2,3,3,4,4-²H₅] glutamic acid respectively.

72-45

KING, J.A.G., PERCIVAL, A.,
ROBSON, N.C., SWAN, G.A.

Chemistry of melanins. XI. Distribution of the polymeric linkages in dopa melanin.

J. Chem. Soc. C (1970), 10,
1418-22

C.A. 73 (1970), 35751

Deuterated (\pm)-3,4-dihydroxy-phenylalanine was converted into melanin both by autoxidation and enzymically.

72-46

KOVACS, J., CORTEGIANO, H.
COVER, R.S., MAYERS, G.L.Isoracemization of N-carbobenzoxy-
amino acid ester derivatives.J. Amer. Chem. Soc. 93 (1971), Mar.,
1541-3N.S.A. 25 (1971), 26257The base-catalyzed racemization and
deuterium exchange of N-carbobenzoxy-
S-benzyl-L-cysteine pentachlorophenyl
ester in chloroform in the presence
of triethylamine and monodeuteriome-
thanol were investigated.

2.1.6 - STEROIDS

2.1.7 - MINERAL COMPOUNDS AND
MISCELLANEOUS COMPOUNDS

72-47

BABAJAN, S.G., ARUTJUNJAN, A.M.

Distribution of trace impurities in
sodium metasilicate hydrates. I.
Heterogeneous isotopic exchange of
sodium metasilicate nonahydrate. II.
Heterogeneous isotopic exchange of
sodium, deuterium and tritium in
saturated solutions containing stabil-
ized crystals of sodium metasilicate
nonahydrate.Radiokhimiya 12 (1970), 3, 417-29Chem. Inform.-Dienst Anorg. Chem.
(1970), 40, 335The isotopic exchange of Na, D or ^3H
between stabilized $\text{Na}_2\text{SiO}_3 \cdot 9\text{H}_2\text{O}$ crystals
and a saturated solution of Na_2SiO_3 la-
belled with ^{22}Na , D or ^3H was studied
at 14-25°.

72-48

BOWERS, M.T., ELLEMAN, D.D.

Relative proton affinity of argon and
deuterium.J. Amer. Chem. Soc. 92 (1970), 16 Dec.,
7258-62N.S.A. 25 (1971), 10552The reactions of protons with
mixtures of Ar and D_2 at high
pressures were studied.

72-49

DAVIS, J., DRAKE, J.E.,
GODDARD, N.Phosphine-borane derivatives.
Part III. A proton magnetic re-
sonance spectroscopic study of
methyl- and silyl-phosphine with
[$^1\text{H}_6$]- and [^{10}B]-diborane.J. Chem. Soc. A (1970), 18,
2962-4N.S.A. 25 (1971), 10547It was found that hydrogen-
deuterium exchange occurs between
sulfur and boron sites in silyl-
phosphine-borane but not between
carbon and boron sites in methyl-
phosphine-borane.

72-50

OTTO, K., SHELEF, M., KUMMER,
J.T.Studies of surface reactions of
NO by isotope labelling. II.
Deuterium kinetic isotope effect
in the ammonia-nitric oxide re-
action on a supported platinum
catalyst.J. Phys. Chem. 75 (1971), Apr.1,
875-9N.S.A. 25 (1971), 29063The kinetic isotope effect was
measured for the reaction between
 $\text{NH}_3(\text{ND}_3)$ and NO over a supported
Pt catalyst at 202,5°C.

72-51

SCHUNN, R.A.

Interaction of transition metal
hydride complexes with deuterium,
ethylene- d_4 , and 1-butene.Inorg. Chem. 9 (1970), Nov.,
2567-72N.S.A. 25 (1971), 2170The reactions of a series of
transition metal hydride complexes

with D_2 , C_2D_4 , and 1-butene were studied by mass spectroscopic and gas chromatographic techniques.

72-52

VON HAHN, H.E.A., PETERS, E.

Kinetics of copper(II)- and copper(I)-catalyzed deuterium exchange in sulfuric and perchloric acid solutions.

J. Phys. Chem. 75 (1971), 18 Feb., 571-3

N.S.A. 25 (1971), 18390

The rate of deuterium exchange was found to be markedly greater with cuprous ions than with cupric ions as catalyst.

2.2 - TRITIUM COMPOUNDS

2.2.0 - GENERAL

72-53

MCWLAND, F.S.

Inapplicability of the simple kinetic theory of hot reactions to certain binary recoil tritium systems.

J. Phys. Chem. 74 (1970), 24 Dec., 4603-5

N.S.A. 25 (1971), 15710

Comments are given concerning the inapplicability of the simple kinetic theory of hot reactions to certain binary recoil tritium systems.

See also:

72-18 : Oxygen and hydrogen isotope exchange in alcohols.

2.2.1 - ALIPHATIC COMPOUNDS

72-54

CACACE, F., CIPOLLINI, R., CIRANNI, G.

Reactions of He^3H^+ ions with gaseous hydrocarbons. II. Methane and ethane.

J. Amer. Chem. Soc. 90 (1968), 28 Feb., 1122-6

N.S.A. 25 (1971), 34677

The He^3H^+ formed from the decay of gaseous tritium exothermically protonate the methane giving excited $CH_3^3H^+$ ions and the ethane giving excited $C_2H_5^3H^+$. $CH_3^3H^+$ can be either collision stabilized at 760 torr or decompose into tritiated methyl ions and hydrogen. $C_2H_5^3H^+$ ions give labelled ethyl ions.

72-55

GOLD, V., ROLSTON, J.H.

Kinetics of hydrogen isotope exchange reactions. Part XVIII. Aliphatic exchange induced by β -radiation on aqueous solutions of alcohols.

J. Chem. Soc. B (1970), 9, 1795-800

N.S.A. 25 (1971), 6361

t-Butyl alcohol with tritium in the methyl group was obtained by β -radiation-induced hydrogen exchange reaction of aqueous solutions of t-butyl alcohol containing tritium as part of the solvent.

72-56

MASKORNICK, A.J.

Proton exchange kinetics of olefins in cyclohexylamine.

Univ. of California (1969), 137 pp University Microfilms Order 70-13114

N.S.A. 25 (1971), 2184

Tritium exchange rates were determined for a series of vinylic protons with cesium cyclohexylamide in cyclohexylamine at 25°.

72-57

PRYOR, W.A., GRIFFITH, M.G.

Reactions of the hydrogen atom in solution. III. The photolysis of thiols. Studies of tritium-labelled thiols.

J. Amer. Chem. Soc. 93 (1971), 24 Mar., 1408-11

N.S.A. 25 (1971), 26251

After photolysis in the presence of various organic hydrogen donors propanethiol, tritiated at the S-H bond, was transformed to propanethiol labelled both into the side chain and into QH.

72-58

ROLSTON, J.H., GOLD, V.

Kinetics of hydrogen isotope exchange reactions. Part XX. Aliphatic exchange induced by γ -radiation on aqueous solutions of t-butyl alcohol (2-methylpropan-2-ol).

J. Chem. Soc. B (1970), 9, 1808-11

N.S.A. 25 (1971), 6363

Tritium exchange between tritiated water and the methyl group of the t-butyl alcohol induced by γ -radiation from a ^{60}Co source was investigated in partially aerated or in degassed solutions.

2.2.2 - AROMATIC COMPOUNDS

72-59

CACACE, F., CAROSELLI, M., CIPOLLINI, R., CIRANNI, G.

Reactions of He^3H^+ ions with gaseous hydrocarbons. III. Cyclopropane, propane and n-butane.

J. Amer. Chem. Soc. 90 (1968), 24 Apr., 2222-7N.S.A. 25 (1971), 34676

The reaction of He^3H^+ ion with C_3H_6 yields labelled C_3H_6 hydrocarbons.

72-60

CACACE, F., GUARINO, A., POSSAGNO, E.

Reactions of He^3H^+ ions with gaseous hydrocarbons. IV. Cyclobutane, cyclopentane and cyclohexane.

J. Amer. Chem. Soc. 91 (1969), 4 June, 3131-4N.S.A. 25 (1971), 34675

Stabilized cycloalkanium ions are obtained by the protonation of cyclobutane, cyclopentane, and cyclohexane with helium tritide obtained from the

 β decay of molecular tritium.

2.2.3 - HETEROCYCLIC COMPOUNDS

2.2.4 - CARBOHYDRATES

2.2.5 - PEPTIDES, AMINO ACIDS, PROTEINS

72-61

ANONYMOUS

Tritiation of protein hormones.

CU-3635-3 (1971), 39 pp.

N.S.A. 25 (1971), 37707

The preparation of ^3H -ACTH with high specific activity is described. Purification, chromatographic characterization, and immunological stability of the labelled ACTH are also dealt with.

72-62

BLOSS, K.

Liquid tritioammonia as a tritiating agent.

J. Label. Compounds 5 (1969), Oct.-Dec., 355-62

Piperidine, 5-hydroxytryptophan, glutamine and asparagine were tritiated by refluxing at -35° with tritioammonia. Ortho-bromobenzoic acid in toluene-dioxane was used in liquid-scintillation counting of tritioammonia. Autoradiolysis was no problem.

72-63

CRONE, M.

Radiation stimulated incorporation of ^3H -thymidine into diplotene oocytes of the guinea pig.

Nature 228 (1970), 31 Oct., 460.N.S.A. 25 (1971), 13367

A small but autoradiographically detectable incorporation of injected ^3H -thymidine into the DNA of diplotene oocytes was obtained

by x irradiation of a 1-day female guinea pig with 5000 R.

72-64

JAWOROWSKI, Z., BILKIEWICZ, J., ZYLICZ, E.

Incorporation of tritium in hair.

Int. J. Radiat. Biol. 18 (1970), 487-90

N.S.A. 25 (1971), 10954

The incorporation of tritium in hair was studied by administration of tritium. The influence of washing procedures on the elution of tritium from internally and externally contaminated hair was investigated.

72-65

MILLER, O.J.

Autoradiography in human cytogenetics.

Advan. Hum. Genet. 1 (1970), 35-130

N.S.A. 25 (1971), 21534

Methods for the preparation of radioautograms and the application of autoradiography in human studies are reviewed. The use of ^3H -5-uridine, ^3H -cytidine, and ^3H -thymidine as tracers for timing the synthesis of DNA and RNA at various times during the cell cycle are discussed.

72-66

SANIKIDZE, V.D., ROMANOVSKAYA, L.L.

Water exchange of tritium oxide in the brain and some peripheral organs of rabbits.

Med. Radiol. 15 (1970), 12, 18-20

N.S.A. 25 (1971), 32347

Tritium oxide exchange in some organs of rabbits after intravenous injection of tritiated water was studied in function of time after injection.

2.2.6 - STEROIDS

72-67

AGURELLI, S., NILSSON, I.M., OHLSSON, A., SANDBERG, F.

Metabolism of cannabis. III. Metabolism

of tritium-labelled Δ^1 -tetrahydrocannabinol in the rabbit.

Biochem. Pharmacol. 19 (1970), 4, 1333-9

C.A. 73 (1970), 54166

The title compound labelled with ^3H is almost completely metabolized to more polar metabolites after intravenous injection in the rabbit.

72-68

BRODIE, H.J., HAY, C.E.

Effects of hydrogen isotope labelling on steroid metabolism.

Biochem. J. 120 (1970), 667-9

N.S.A. 25 (1971), 16022

When oestrone-dione (oestr-4-ene-3,17-dione) was labelled at the C-7 β position with tritium and at C-4 with ^{14}C there was a marked increase in the $^3\text{H}/^{14}\text{C}$ ratio in the 6 β -hydroxy compound. Thus the hydrogen-isotope-labelled molecules were converted preferentially into 6 β -hydroxyoestrone-dione.

72-69

NUSSDORFER, G.G., MAZZOCCHI, G.

Autoradiographic study of the incorporation of tritiated cholesterol into the zona reticularis of the rat adrenal cortex.

Z. Zellforsch. 102 (1969), 2, 205-13

Nuclear Medicine (1970), 7150

A time study of the incorporation of cholesterol ^3H into three types of cells (light, dark, and very dark cells) has been made.

2.2.7 - MINERAL COMPOUNDS AND MISCELLANEOUS COMPOUNDS

72-70

ANONYMOUS

Progress report, 1969-1970.

Stichting Instituut voor Kernfysisch Onderzoek, Amsterdam, NP-18497, 96 pp.
N.S.A. 25 (1971), 22962

The reactions of alkali metal halides with recoil tritium and production of labelled products by recoil ^{35}Cl are included in this report.

72-71

BALLEBAEU, P.

Oxidation of tritium to tritiated water and health physics.

CEA-Bib-179 (1970), Nov., 65 pp.

N.S.A. 25 (1971), 16195

In the presence of air, tritium is converted into tritiated water by self-oxidation by β radiation, and isotopic exchange between gaseous ^3H and the ^1H atoms of water vapor. The rate constants of these conversions were measured.

72-72

TANAKA, H., NEGITA, H.

Fractionation of tritium in the crystallization of inorganic hydrates from a tritiated solution.

Bull. Chem. Soc., Jap. 43 (1970), Oct., 3079-82N.S.A. 25 (1971), 10688

The fractionation of tritiated water in the crystal-growth processes of several inorganic hydrated salts from concentrated aqueous solutions was explained by modifying the Bennema's theory.

See also :

72-47 : Distribution of trace impurities in sodium hydrates.

2.3 - CARBON-14 COMPOUNDS

2.3.0 - GENERAL

2.3.1 - ALIPHATIC COMPOUNDS

72-73

MARTON, A.F., DUTKA, F.

Radiometric method for the quantitative determination of tertiary butyl acetate.

Radiochem. Radioanal. Lett. 6 (1971), 3 Apr., 185-8N.S.A. 25 (1971), 31838

The determination of tert-butyl acetate by reaction with ^{14}C -acetyl chloride in nitromethane is not disturbed in this method by the presence of primary and secondary alkyl acetates.

72-74

NOSZKO, L., SZABOLCS, A., SZAMMER, J.

Effect of cation of the exchange reaction in the ketonic pyrolysis of mixtures of aliphatic carboxylates.

Radiochem. Radioanal. Lett. 6 (1971), 2 Mar., 129-31N.S.A. 25 (1971), 20979

Labelled ketones were obtained by thermal exchange reaction between labelled and non-labelled aliphatic acid salts.

2.3.2 - AROMATIC COMPOUNDS

72-75

PEARSON, N.

A ^{14}C kinetic isotope effect study of nucleophilic substitution reactions of p-substituted benzyl chlorides.

Fayetteville, Ark., Univ. of Arkansas. University Microfilms Order 70-26219, 225 pp.

N.S.A. 25 (1971), 18407

^{14}C kinetic isotope effect of nucleophilic displacement reactions of p-substituted benzyl- ^{14}C chlorides was studied in aqueous dioxane at 40° .

72-76

YUKAWA, Y., ANDO, T., KAWADA, M., TOKEN, K., KIM, S.G.

^{14}C isotope effects in the formolysis and trifluoroacetylation of 2-aryl-(aryl- ^{14}C)-ethyl p-nitro benzene sulphonates.

Tetrahedron Lett. 13 (1971), Mar., 847-50

N.S.A. 25 (1971), 31909

Studies are reported on the ^{14}C isotope effect of the title compound in formic acid and trifluoroacetic acids.

2.3.3.- HETEROCYCLIC COMPOUNDS

2.3.4 - CARBOHYDRATES

72-77

TRON, P., WICHAUD, G.

Galactosemia : metabolism of galactose ^{14}C in blood cells. Application to the distinguishing of heterozygotes.

Rev. Fr. Etud. Clin. Biol. 14 (1969), Jan., 12-18

N.S.A. 25 (1971), 10485

Blood cells were labelled with galactose U ^{14}C , extracted in 80 and 20% ethanol and analyzed by chromatography on Whatman No. 4 paper in two solvent systems : water-saturated phenol and n-butanol-propionic acid-water.

2.3.5 - PEPTIDES, AMINO ACIDS, PROTEINS

72-78

NAJEAN, Y., ARDAILLOU, N., DRESCH, C.

Platelet lifespan.

Annu. Rev. Med. 20 (1969), 47-62

N.S.A. 25 (1971), 2579

Platelet lifespan in man and in animals can be measured by radioisotopic methods.

72-79

NEJEDLY, Z.

New methods of enzymic synthesis of radioactive nucleosides.

Jad. Energ. 16 (1970), 233-8

N.S.A. 25 (1971), 2520

Labelled nucleotides at different stages of phosphorylation can be prepared using an unpurified enzyme preparation from cells of *Brevibacterium ammoniagenes* which catalyse the phosphoribosylation of the nucleic acid bases.

72-80

SONENSHINE, D.E.

Fertility and fecundity of *Dermacentor variabilis* reared from radioisotope-tagged larvae.

J. Econ. Entomol. 63 (1970), Oct., 1675-6

N.S.A. 25 (1971), 16295

Larvae of American dog ticks were labelled with ^{14}C .

2.3.6 - STEROIDS

72-81

SPARAGANA, M.

Rapid double-isotope dilution derivative assay of plasma testosterone.

J. Nucl. Med. 12 (1971), May, 253-6

N.S.A. 25 (1971), 37841

Carbon-14-T is used as marker steroid and ^3H -acetic anhydride as deriving reagent for mass measurements of testosterone.

72-82

ZANDER, J.M., CASPI, E.

Stereospecificity of the cholesterol Δ^2 -dehydrogenase of *Tetrahymena pyriformis* and the origin of the C-22 protons of cholesterol.

J. Biol. Chem. 245 (1970), 7, 1682-7

C.A. 73 (1970), 467

Dehydrogenation by *T. pyriformis* of biosynthetic cholesterol derived from (2R)-(2- ^3H ,2- ^{14}C) and

from (2S) mevalonic acid 2-³H,2-¹⁴C in the rat showed that the 2-pro R-H of mevalonic acid adopts the 22-pro-R configuration in cholesterol and the 2-pro-S-H of mevalonic acid adopts the 22-pro-S configuration.

See also:

72-68: Effects of hydrogen-isotope labelling on steroid metabolism.

2.3.7 - MINERAL COMPOUNDS AND MISCELLANEOUS COMPOUNDS

72-83

ANONYMOUS

Stable gaseous isotope separation and purification: July-September 1970.

MLM-1768 (1970), 11 Dec., 35 pp.

N.S.A. 25 (1971), 8424

Carbon isotope separation, separation of stable isotopes of argon, krypton, neon and xenon are studied.

72-84

KRYUKOV, Yu.B., BASHKIROV, A.N., LIBEROV, L.G., SMIRNOVA, R.M., FRIDMAN, R.A.

Exchange of carbon and oxygen atoms of carbon dioxide under conditions of syntheses from carbon monoxide and hydrogen on iron catalysts.

Kinet. Katal. 11 (1970), Jul.-Aug., 1069-70

N.S.A. 25 (1971), 31900

The isotope exchange in the synthesis of CO₂ from CO and H₂ on iron catalyst was investigated using ¹⁴C and ¹⁸O.

72-85

NEKIPELOV, V.N., KASATKINA, L.A.

Isotopic exchange of carbon monoxide on zinc oxide.

Kinet. Katal. 11 (1970), Jul.-Aug., 910-5

N.S.A. 25 (1971), 31899

The kinetics of isotopic exchange between CO and CO₂ and the exchange of CO with the superficial oxygen of ZnO were investigated.

72-86

ZIELINSKI, M., WAWER, A., TABAK, A.

Contribution to the ¹⁴C exchange studies in the system ¹⁴CO₂-CO-quartz walls.

Nukleonika 15 (1970), 165-76

The kinetics of isotopic exchange between CO and labelled CO₂ in a quartz vessel at 550° to 970° are reported.

2.4 - HALOGEN LABELLED COMPOUNDS

72-87

ANONYMOUS

Halogen atom reactions activated by radiative neutron capture and ^{82m}Br and ^{130m}I isomeric transition.

COO-1617-27 (1971), 15 Feb., 115 pp.

N.S.A. 25 (1971), 18483

The kinetics of the addition process of iodine to various alkene isomers in solution at 25°, cyclopropene, benzene and alkylbenzene in the liquid and solid phase were investigated.

72-88

BERONIUS, P., HOLMGREN, A., NILSSON, A.M., WIKANDER, G.

Electrolyte effect in the isotopic exchange reaction between ammonium bromide and butyl bromide in acetone.

Radiochem. Radioanal. Lett. 5 (1970), 6 Nov., 131-5

N.S.A. 25 (1971), 4071

The exchange reaction $\text{NH}_4^{82}\text{Br} + \text{BuBr} \rightleftharpoons \text{NH}_4\text{Br} + \text{Bu}^{82}\text{Br}$ was studied in acetone as solvent.

72-89

BERONIUS, P., PATAKI, L., NILSSON, A.M., WIKANDER, G.

Electrolyte effects in the isotopic exchange between alkali iodides and methyl iodide in ethanol.

Radiochem. Radioanal. Lett. 6 (1971), 6, 333-7

N.S.A. 25 (1971), 37372

The exchange of ^{131}I between methyl iodide and sodium, potassium and rubidium iodide in ethanol can be explained by exchange of both free iodide ions and alkali iodide ion pairs with the organic halide.

72-90

ELATRASH, A.M., NOUR, F.A.

Isotopic exchange reactions between chloride ions and some organic chlorides.

J. Chem. U.A.R. 12 (1969), 155-64

N.S.A. 25 (1971), 15614

The exchange of chloride ion between NaCl and benzyl chloride, p-nitrobenzyl chloride, 1-phenylethyl chloride and 1-p-nitrophenylethyl chloride was studied in 90 weight % ethanol solutions at 35 and 50°C.

72-91

HAUBOLD, U., JOST, H., zum WINKEL, K.

Sequential scintigrams of the kidney with ^{131}I -o-iodo-hippuric acid and $^{113\text{m}}\text{In}$ -EDTA.

Strahlentherapie 140 (1970), Jul., 89-96

N.S.A. 25 (1971), 13499

Sequential scintigrams of the kidneys were performed comparing ^{131}I -o-iodo-hippuric acid and $^{113\text{m}}\text{In}$ -EDTA.

72-92

HOLMGREN, A., NILSSON, A.M., BERONIUS, P.

Electrolyte effects in the isotopic exchange between alkali iodides and methyl iodide in propanol.

Radiochem. Radioanal. Lett. 6 (1971), 31 May, 339-43

N.S.A. 25 (1971), 37373

The isotopic exchange between alkali

iodides (NaI, KI, RbI, and CsI) and methyl iodide in propanol at 25° was studied. The rate of exchange decreases with increasing electrolyte concentration.

72-93

IOFA, B.Z., NESMEYANOV, A.N., KIREEV, G.I.

Study of iodine extraction kinetics by means of the isotope exchange method;

Teor. Osn. Khim. Tekhnol. 4 (1970), May, 429-32

N.S.A. 25 (1971), 15595

The rate of extraction and isotopic exchange of iodine in the H_2O - I_2 -KI- CCl_4 system was found to be limited by the diffusion.

72-94

JOECHHEL, E., LANTHLE, F., CHEMLA, K.

Isotopic exchange kinetics between chloromethyl formate and chloride ion.

J. Chim. Phys. 67 (1970), Oct., 1807-11

N.S.A. 25 (1971), 15606

The kinetics of the exchange of ^{36}Cl between LiCl and chloromethylformate in methyl ethyl ketone in the temperature range -21° to +22.5° was investigated by analyzing samples in the vapor phase.

72-95

LENGELMANN, F.W.

The application of atomic energy techniques to increase productivity of domestic livestock. CONF-680112, 153-66

N.S.A. 25 (1971), 26578

Studies using radioisotopes for research on increasing productivity of farm animals are

reviewed. The following isotopes are used: ^{131}I and ^{125}I for dairy cattle, Ca, ^{91}Y , ^{14}C -polyethylene, glycol, hemoglobin ^{59}Fe , ^{40}K . A liquid scintillation type of whole-body counter for research on animal productivity is also described.

72-96

MALOV, G.A.

Express method of determining the circulation blood volume with the aid of radiiodine-labelled albumin.

Med. Radiol. 15 (1970), 11, 31-44N.S.A. 25 (1971), 24035

The circulating blood volume was determined by the use of radioiodine-labelled albumin.

92-97

McLENNAN, D.J., BUNNETT, J.F.

Bromine scrambling accompanying base-catalyzed isomerization of 1,2,4-tribromobenzene.

J. Amer. Chem. Soc. 93 (1971), 10 Mar., 1198-1201N.S.A. 25 (1971), 26221

1,2,4-tribromobenzene labelled with Br in the 1 position undergoes partial isomerization to 1,3,5-tribromobenzene during exposure to potassium anilide and aniline in liquid ammonia.

72-98

OGINO, N.

Study of regional lung function tests using the ^{131}I and ^{133}Xe double isotope tracer method.

Nippon Kyobu Geka Gakkai Zasshi 18 (1970), 202-20N.S.A. 25 (1971), 26841

The radioactivities of ^{131}I and ^{133}Xe injected into the cubital vein of patients were measured by two counters, one being used for ^{131}I and the other being synchronized for counting radio-

activity from ^{133}Xe .

72-99

PATAKI, L., BERONIUS, P., KOCSIS, E.

Some data to the reaction between methyl iodide and alkaline iodide.

Radiochem. Radionucl. Lett. 5 (1970), 31 Dec., 313-7N.S.A. 25 (1971), 12996

The isotopic exchange reaction between methyl iodide and potassium iodide in ethanol at 35° was studied.

72-100

PAXSON, J.K.

Ligand substitution reactions of platinum(II) complexes. Chloro(diethylenetriamine) platinum(II)-chloride exchange.

IS-T-403 (1970), Nov., 84 pp.

N.S.A. 25 (1971), 20975

Kinetics of the isotopic exchange in the title system was studied using ^{36}Cl , employing an ion exchange quenching technique and activity determination by a liquid scintillation counter.

72-101

SOMMER, L.H., HOMER, G.D., MESSING, A.W.

Halide-halide exchange at asymmetric silicon. New evidence against a siliconium ion-pair mechanism.

J. Amer. Chem. Soc. 93 (1971), 21 Apr., 2093-4N.S.A. 25 (1971), 34579

The chloride-radiochloride exchange of optically active α -NpPhMeSi^{*}Cl with $c\text{-C}_6\text{H}_{11}\text{NH}_2$ ^{36}Cl is based on a mixture of inversion and retention mechanism and not on a siliconium ion-pair mechanism.

72-102

WAJDA, S., ZARZECNY, A.

Isotopic exchange of radiochlorine

in the system $(MoCl_6)^{3-}-Cl^-$.

Nukleonika 15 (1970), 631-9

N.S.A. 25 (1971), 34583

The exchange kinetics of ^{36}Cl in hexachloromolybdate(III) in formamide solution were studied and compared with isotopic exchange of ^{14}C in the system $[Mo(CNS)_6]^{3-}-^{14}CNS^-$.

72-103

YAGI, M., KONDO, K.

Comparison of isomeric transition-activated ^{80}Br reactions in $CH_4-^{80}mBr$ and $CH_4-H^{80}mBr$ systems.

Radiochem. Radioanal. Lett 5 (1970), 16 Oct., 75-81

N.S.A. 25 (1971), 2226

The $CH_3-^{80}mBr$ yield in the gaseous $CH_4-^{80}mBr$ system was much higher than the yield in the gaseous $CH_4-H^{80}mBr$ system.

72-104

YAMAMOTO, J., MIYAGAWA, M.

Rate constants of exchange reaction of the type $RI + I^* - RI^* + I^-$ in acetone-water solution.

Tottori Daigaku Kyoikugakubu Kenkyu Hokoku, Shizenkagaku 20 (1969), 2, 45-50

N.S.A. 25 (1971), 2177

The rate constants of the exchange reaction between alkyl iodides and iodide ion in acetone-water solution was studied by using ^{131}I as an indicator.

72-105

YIPINTSOI, T., GUSTAFSON, D.C., SASSINGTHIRIGTIS, J.B.

Separation of unbound iodide in ^{125}I -labelled antipyrine.

J. Nucl. Med. 12 (1971), Apr. 149-52

N.S.A. 25 (1971), 23694

Iodo antipyrine labelled with ^{125}I was studied to determine the presence of unbound iodide and to separate it from the labelled com-

pound. Three methods of separating the unbound iodide were studied: paper chromatography, thin-layer chromatography and high-voltage electrophoresis.

See also:

72-70: Progress report, 1969-70

2.5 - PHOSPHORUS-32 COMPOUNDS

72-106

FUHS, G.V., CANELLI, E.

^{33}P autoradiography used to measure phosphate uptake by individual algae.

Limnol. Oceanogr. 15 (1970), Nov., 962-7

N.S.A. 25 (1971), 26596

Diatoms from pure cultures and samples of lake phytoplankton were labelled with ^{32}P and concentrated by centrifuge and membrane filter techniques.

72-107

TREBICHAUSKY, I., NEDVIDEK, J.

Incorporation of radiophosphorus into nucleic acids of frog embryo.

Folia Biol. (Prague) 17 (1971), 1, 54-8

N.S.A. 25 (1971), 26617

The nucleic acids of frog eggs and embryos were labelled with ^{32}P and administered in the form of orthophosphate simultaneously with pituitary implantation.

2.6 - SULPHUR-35 COMPOUNDS

72-108

FILIPPOVICH, I.V., ZHULANOVA, Z.I., TREBENOK, Z.A., SHEREMET'EVSKAYA, T.N., ROMANTSEV, E.F.

In-vivo fixation of ^{35}S β -mercaptoethylamine (^{35}S -MEA) by proteins of the cytoplasm and of

the nucleus of thymus cells of the rat.

Dokl. Akad. Nauk SSSR 195 (1970),
1 Nov., 225-8

N.S.A. 25 (1971), 32441

The ^{35}S -MEA HCl injected to white rats at a dose rate of 150 mg/kg was fixed by the proteins of the cytoplasm and of the nucleus of the thymus cells.

72-109

SPEEDING, D.J.

Detection of latent fingerprints with $^{35}\text{S}_{\text{O}_2}$.

Nature 229 (1971), 8 Jan., 123-4

N.S.A. 25 (1971), 21541

Latent fingerprints on paper and on finely woven fabrics were detected by autoradiography of the fabrics after treatment with $^{35}\text{S}_{\text{O}_2}$.

2.7 - OXYGEN LABELLED COMPOUNDS

72-110

BLANCHARD, M.

Isotopic oxygen exchange by catalysts in the V_2O_5 - MoO_3 series.

Bull. Soc. Chim. Fr. 3 (1971), Mar., 814-9

N.S.A. 25 (1971), 37377

The activation energy in the isotopic exchange of ^{18}O by V_2O_5 - MoO_3 catalysts is maximum for an oxide containing 30% MoO_3 .

72-111

BROCKHEAD, J.A., KANE-MAGUIRE, N., LAUDER, I.

Racemization and ^{18}O exchange studies of heterochelate chromium(III) complexes. II. The cations oxalato-bis(2,2'-bipyridine)chromium(III), oxalato-bis(1,10-phenanthroline)chromium(III), and oxalato-bis(ethylenediamine)chromium(III).

Inorg. Chem. 10 (1971), May, 955-8

N.S.A. 25 (1971), 34601

The kinetics of racemization and oxygen-18 exchange for the title compounds have been studied in acid solution.

72-112

DZEVENTSKI, Z., MUZYKANTOV, V.S.

Isotope exchange between oxygen and stannic oxide.

Kinet. Katal. 12 (1971), 1, 207-11

N.S.A. 25 (1971), 37382

The kinetics of the isotopic exchange between molecular oxygen and SnO_2 at 11 mm Hg and between 500 and 700° were investigated by means of a mass spectrometer.

72-113

FANTIDIS, J., BHHALT, D.H.

Variations of the carbon and oxygen isotopic composition in stalagmites and stalactites: evidence of non-equilibrium isotopic fractionation.

Earth Planet. Sci. Lett. 10 (1970), Dec., 136-44

N.S.A. 25 (1971), 10684

The study of the concentrations of the ^{18}O and ^{13}C along homogeneous layers of stalagmites and stalactites showed an increase of the concentrations in the direction of water flow.

72-114

FRY, A.

Tracer and isotope effect studies in organic chemistry.

ORO-3234-23 (1971), 1 Feb., 66 pp.

N.S.A. 25 (1971), 34752

Research progress on ^{18}O and ^{15}N exchange studies, ^{18}O and deuterium tracer studies in photochemical addition, reduction and hydration reactions is related in this report.

72-115

HALMANN, M., SCHMIDT, H.L.

Cyanogen induced synthesis of oxygen-18 labelled β -ribofuranose-1-phosphate and its acid-catalyzed hydrolysis.

J. Chem. Soc. C (1970), 9, 1191-3

Chem. Inform.-Dienst Anorg. Chemie (1970), 33, 184

β -Ribofuranosyl phosphate was obtained by phosphorylation of D-ribose with $\text{HPL}^{18}\text{O}_4^{2-}$ in dilute solution in the presence of cyanogen.

72-116

HASTY, R.A., BOGGS, J.E.

Isotopic exchange study on thorium peroxide.

J. Inorg. Nucl. Chem. 33 (1971), Mar., 874-6

N.S.A. 25 (1971), 29089

Isotopic exchange of ^{18}O between thorium peroxy-chloride and D_2O containing 1,545% ^{18}O was investigated.

72-117

KAMINSKI, K.J., RUTHERFORD, W.M., WILLIS, M.S.

Thermal diffusion column coefficients for the separation of $^{14}\text{N}_2$ - $^{14}\text{N}^{15}\text{N}$ and $^{16}\text{O}_2$ - $^{16}\text{O}^{18}\text{O}$.

MLM-1439 (1970), 23 Dec., 127 pp.

N.S.A. 25 (1971), 8423

The thermal diffusion column coefficients H' , K' and K_d of the Jones and Furry theory were compared to coefficients obtained from experiments dealing with the separation of the $^{14}\text{N}_2$ - $^{14}\text{N}^{15}\text{N}$ and the $^{16}\text{O}_2$ - $^{16}\text{O}^{18}\text{O}$ systems.

72-118

KATO, Y.

^{18}O tracer study of U(IV)-U(VI) electron exchange reaction.

Bull. Tokyo Inst. Technol. 96 (1970), Mar., 133-6

N.S.A. 24 (1970), 41282

The oxygen exchange between uranium ion and water during the electron exchange reaction is studied.

72-119

KISE, M., OAE, S.

Sulfoxides. XXX. Reaction of sulfoxides with acylating agents. III. Mechanism of the reactions of phenyl methyl sulfoxide with acetic anhydride.

Bull. Chem. Soc. Jap. 43 (1970), 5, 1426-30

C.A. 73 (1970), 55355

Acetoxy interchange and the Pummerer reaction were studied for reaction of aryl methyl sulfoxides with Ac_2^{18}O .

72-120

KOBAYASHI, M., MINATO, H., OGI, Y.

Scrambling of oxygen in the diester produced from labelled diacyl peroxide-olefin reaction.

Bull. Chem. Soc. Jap. 43 (1970), 4, 1158-60

C.A. 73 (1970), 24666

dl-Dihydroanisoin bis m-bromobenzoate uniformly labelled with ^{18}O was obtained by reaction between p,p'-dimethoxy-trans-stilbene and m,m'-dibromobenzoyl peroxide labelled with ^{18}O at the carbonyl group.

72-121

KOBAYASHI, M., MINATO, H., OGI, Y.

Organic sulfur compounds. XX. Mechanism of decomposition of carboxylic sulfuric anhydrides.

Bull. Chem. Soc. Jap. 43 (1970), 3, 905-8

C.A. 73 (1970), 13919

In this study, the ethyl benzoyloxy-sulfinate labelled with ^{18}O

was prepared from ^{18}O -labelled benzoic acid and ethyl-chloro-sulfite.

72-122

KULEVA, N.V., KARANDASHOV, E.A., PANTELEEVA, N.S.

Effect on trinitrophenylation of myosin on the isotopic exchange reaction of oxygen in the system myosin ATP- H_2^{18}O .

Biokhimiya 35 (1970), Jan.-Feb., 42-7

N.S.A. 25 (1971), 8248

The ^{18}O exchange reaction during ATP hydrolysis in H_2^{18}O was inhibited by treatment of myosin, used as catalyst, by 2,4,6-trinitrobenzenesulfonate.

72-123

LEE, K.-H.

Isotope exchanges involving various isomorphous 6-molybdo and 6-tungsto heteropoly anions. The exchange of intact CrO_6 units.

Georgetown Univ. (1970), 244 pp. University Microfilms Order N° 71-6046

N.S.A. 25 (1971), 31935

The exchanges of ^{51}Cr and ^{18}O between $[\text{CrO}_6\text{Mo}_6\text{O}_{18}\text{H}_6]^{-3}$, $[\text{NiO}_6\text{Mo}_6\text{O}_{18}\text{H}_6]^{-4}$, $[\text{NiO}_6\text{W}_6\text{O}_{18}\text{H}_6]^{-4}$ and H_2O were studied.

72-124

LINDBLAD, B., LINDSTEDT, G., LINDSTEDT, S.

Mechanism of enzymic formation of homogentisate from p-hydroxyphenylpyruvate.

J. Amer. Chem. Soc. 92 (1970), 16 Dec., 7446-9

N.S.A. 25 (1971), 10553

Labelled homogentisate was obtained by an enzymic reaction of p-hydroxyphenylpyruvate in $^{18}\text{O}_2$ and in H_2^{18}O . Oxygen is incorporated both in the new hydroxy and in the carboxyl groups.

72-125

MINACHEV, Kh.M., SAVOST'YANOV, E.N., KONDRAT4EV, D.A., CHANG, Z.N., ANTOSHIN, G.U.

Isotope exchange between molecular oxygen and synthetic zeolites.

Izv. Akad. Nauk SSSR, Ser. Khim. 4 (1971), Apr., 841-3

N.S.A. 25 (1971), 34580

The kinetics of ^{18}O exchange at 600 to 700° between O_2 and three zeolites were found to be closely similar.

72-126

MONSE, E.U.

Analysis of isotope-effect calculations illustrated with exchange equilibria among oxynitrogen compounds.

Advan. Chem. Ser. 89 (1969), 148-84

N.S.A. 25 (1971), 8245

Several approximation methods for the prediction and/or temperature extrapolation of isotopic partition-function for some ^{15}N - and ^{18}O -substituted oxynitrogen compounds are evaluated.

72-127

SMITH, J.G.

Study of the separation of the isotopic isomers of NO by low-temperature gas chromatography.

CU-755-7 Sect. 4, 88 pp.

N.S.A. 25 (1971), 8319

Silica gel, glass beads, molecular sieve 5A, and porous glass were investigated in adsorption columns, while Chromosorb W with 2-methylpentane and porous glass with silicone oil were investigated in partition columns.

72-128

TAMAGAKI, S., OGINO, K., KOZUKA, S., OAE, S.

Reaction of lepidine, quinaldine,

and 1-methylisoquinoline N-oxides with acetic anhydride.

Tetrahedron 25 (1970), Oct., 4675-89

N.S.A. 25 (1971), 6320

The mechanism of the reactions of the title compounds with acetic anhydride has been studied by means of both kinetic and ^{18}O tracer experiments.

72-129

TER-POGOSSIAN, K.M.

Brain pathology and regional cerebral oxygen utilization.

Central Nervous System Investigation with Radionuclides (1971), 358-64
CONF-700338

N.S.A. 25 (1971), 32343

Regional cerebral blood flow was measured by means of water labelled with ^{15}O which exchanged its ^{15}O with hemoglobin.

See also:

72-18 : Oxygen and hydrogen isotope exchange in alcohol

72-180: Lung circulation studies using radioactive gases

2.6 - NITROGEN-15 COMPOUNDS

72-130

AXENTE, D., PIRINGER, O.

Kinetics of the $^{15}\text{N}/^{14}\text{N}$ isotopic exchange between nitric oxide and nitric acid.

J. Inorg. Nucl. Chem. 33 (1971), Mar., 665-71

N.S.A. 25 (1971), 29057

The isotope exchange between nitric oxide and nitric acid is the basic reaction of ^{15}N separation by the Spindel-Taylor method. The kinetics of this reaction was studied by introducing nitric oxide ($\text{C}, 365\% \text{ } ^{15}\text{N}$) at atmospheric pressure into a glass contactor containing nitric acid ($1,55\% \text{ } ^{15}\text{N}$).

72-131

GRANDLERG, I.I., PACHEVAL'SKII, P.L., VYSOTSKII, V.I., KHABELNITSKII, R.A.

Indoles. VI. Mechanism of tryptamine formation using nitrogen-15 labelled phenylhydrazine.

Khim. Geterotsikl. Soedin. (1970), 4, 477-9

C.A. 73 (1970), 45812

$\text{Ph}^{15}\text{NHNH}_2$ was prepared and gave with $\text{Cl}(\text{CH}_2)_3\text{Ac}$, 2-methyltryptamine-1- ^{15}N .

$\text{PhNH}^{15}\text{NH}_2$ was prepared from PhNH_2 and $\text{Na}^{15}\text{NO}_2$, and gave 2-methyltryptamine with ^{15}N in the side chain.

72-132

JEEVANADAK, M., TAYLOR, T.I.

Preparation of 99.5 percent ^{15}N by chemical exchange between oxides of nitrogen in a solvent carrier system.

Advan. Chem. Ser. 89 (1969), 119-47

N.S.A. 25 (1971), 8334

The use of solvents (CCl_4 , n-heptane, 1,4-dioxane) as carriers in exchange columns for the $\text{NO-N}_2\text{O}_3$ system increases the single stage enrichment factor α and improves the interphase exchange rate.

72-133

TAKEZAWA, N., TOYOSHIMA, I.

Nitrogen equilibration reaction $28\text{N}_2 + 30\text{N}_2 \rightarrow 2^{29}\text{N}_2$ over a well-reduced iron synthetic ammonia catalyst.

J. Catal. 19 (1970), Dec., 271-6

N.S.A. 25 (1971), 15620

The equilibrium reaction of

nitrogen $^{28}\text{N}_2 + ^{30}\text{N}_2 = 2^{29}\text{N}_2$ was studied over an iron synthetic ammonia catalyst.

See also :

72-114 : Tracer and isotope effect studies in organic chemistry.

72-117 : Thermal diffusion column coefficients for the separation of $^{14}\text{N}_2$ - ^{14}N , ^{15}N and $^{16}\text{O}_2$ - ^{16}O , ^{18}O .

72-127 : Study of the separation of the isotopic isomers of NO by low temperature gas chromatography.

2.9 - CARBON-13 COMPOUNDS

72-134

GHATE, M.R., TAYLOR, T.I.

Preparation of high concentrations of ^{13}C by chemical exchange between amine carbonates and carbon dioxide in a solvent carrier system.

CU-755-7 Sect. 2, 31 pp.

N.S.A. 25 (1971), 8318

The equipment necessary to produce 90% ^{13}C is described in detail.

72-135

KOLLMAN, V.H., ADAMS, W.H., BUCHHOLZ, J.R., CHRISTENSON, C.W., LANGHAM, J., PRICE, R., FOWLER, E.B.

Production of *Candida utilis* with 93 at. percent ^{13}C acetic acid as the sole carbon source.

LA-4551 (1970), Sep., 9 pp.

N.S.A. 25 (1971), 13331

Yeast *Candida utilis* containing 87.4% ^{13}C was obtained by using acetate labelled with ^{13}C as the sole carbon source.

72-136

KOPTYUG, V.A., ISAEV, I.S., GORFINKEL, M.I.

Use of mass spectrometry for determining the position of the label in carbon-13 labelled naphthalenes.

Izv. Akad. Nauk. SSSR Ser. Khim. (1970), 4, 849-9

C.A. 73 (1970), 44501

Naphthalene-1- ^{13}C and naphthalene-2- ^{13}C were prepared by the Grignard synthesis starting with carboxylation of $\text{PhCH}_2\text{CH}_2\text{CH}_2\text{MgBr}$ and $\text{PhCH}_2\text{CH}_2\text{MgBr}$ with $^{13}\text{CO}_2$.

72-137

LOSEVA, T.I., KOCHURIKHIN, V.E. ZEL'VENSII, Ya.D.

Isotope effects in CO_2 adsorption on zeolites.

Kernenergie 13 (1970), 12, 389-91

N.S.A. 25 (1971), 34708

In this study, it was found that sorption of $^{13}\text{CO}_2$ on zeolites is lower than that of $^{12}\text{CO}_2$ in some cases.

72-138

PALKO, A.A.

Method for fractionation of carbon isotopes.

U.S. P. 3,535,079

N.S.A. 25 (1971), 8339

Carbon isotopes are fractionated by contacting an aqueous solution of cuprous chloride and ammonium chloride-carbon monoxide complex with carbon monoxide to exchange ^{13}C in the gas phase with ^{12}C in the liquid phase.

72-139

SCHENK, L.U.

A. Hold-up of amines and amine carbonates on column packings. Density, surface tension and viscosity of the liquid phases.

CU-755-7 Sect. 6, 16 pp.

N.S.A. 25 (1971), 8320

The hold-up of liquid in the packed column used for the concentration of ^{13}C in the chemical exchange system of amine carbonates and CO_2 was measured.

72-140

SCHWIND, R.A.

Isolation of ^{13}C .Chem. Process Eng. 50 (1969), 7, 75-9N.S.A. 25 (1971), 21254

Thermal diffusion, gaseous diffusion, distillation and chemical exchange are evaluated as separation process for production of ^{13}C .

See also :

72-113 : Variation of the carbon and oxygen isotopic composition in stalagmites and stalactites. Evidence of non-equilibrium isotopic fractionation.

2.10 - TECHNETIUM LABELLED COMPOUNDS

72-141

ANGHILERI, L.J., LEE, J.I., MILLER, E.S.

 $^{99\text{m}}\text{Tc}$ labelling of erythrocytes.J. Nucl. Med. 11 (1970), Sep., 530-3N.S.A. 25 (1971), 4414

In this method, the yield of incorporated radioactivity ($^{99\text{m}}\text{Tc}$ bound to the cells of erythrocytes) is 10 to 50 times higher than the previously proposed technique.

72-142

BOYD, R.E.

Research, development, and production of short-lived radio-pharmaceuticals.

Australas. Bull. Med. Phys. Biophys. 46 (1970), 1 Oct., 23-31N.S.A. 25 (1971), 19054

Methods were given for the preparation of $^{99\text{m}}\text{Tc}$ -sodium pertechnetate, $^{99\text{m}}\text{Tc}$ -labelled macroaggregated $\text{Fe}(\text{OH})_2$, and $^{99\text{m}}\text{Tc}$ -labelled rhenium sulfide colloid.

72-143

BROOKEHAM, V.A., WILLIAMS, C.M.

Evaluation of sup $^{99\text{m}}\text{Tc}$ -DTPA as a brain scanning agent.

J. Nucl. Med. 11 (1970), Dec., 733-8N.S.A. 25 (1971), 11189

The chelating agent DTPA complexed with $^{99\text{m}}\text{Tc}$ was compared to $^{99\text{m}}\text{Tc}$ -pertechnetate as a brain scanning agent in clinical use. Both scanning agents are equally suitable. The results suggested that the optimal time to begin scanning is about 1 hr after injection of $^{99\text{m}}\text{TcO}_4^-$.

72-144

BURAGGI, G.L., RODARI, A.

Renal scintigraphy with $^{99\text{m}}\text{Tc}$ -iron ascorbate complex.

Radiol. Med. 56 (1970), May, 408-20N.S.A. 25 (1971), 21777

The use of $^{99\text{m}}\text{Tc}$ -iron ascorbate complex was compared with the use of radiohippuran and Neohydrin ^{197}Hg .

72-145

BURKE, G., HALKO, A., PESKIN, G.

Determination of cardiac output by radioisotope angiography and the image-intensifier scintillation camera.

J. Nucl. Med. 12 (1971), Mar., 112-6N.S.A. 25 (1971), 24250

Cardiac output can be measured by an external monitoring isotopic method with a scintillation camera that need not involve cardiac catheterization. $^{99\text{m}}\text{Tc}$ -albumin is used.

72-146

BURT, R.W., KUHLE, D.E.

Giant splenomegaly in sarcoidosis demonstrated by radionuclide scintiphotography. Response to corticosteroid therapy.

J. Amer. Med. Assoc. 215 (1971), 29 Mar., 2110-11

N.S.A. 25 (1971), 29593

Intravenous administration of ^{99m}Tc -labelled technetium sulfide was followed by scintiphotography in a study of giant splenomegaly.

72-147

CHAPMAN, C., LONSDALE, M.D., HAYTER, C.J.

Use of zirconium sulphate in the preparation of ^{113m}In and ^{99m}Tc -labelled albumin macroaggregates.

Int. J. Appl. Radiat. Isotop. 21 (1970), Nov., 679-81

N.S.A. 25 (1971), 21531

The addition of zirconium in the preparation of HSA macroaggregates labelled with ^{113}In or ^{99m}Tc ensures the production of particles suitable for lung scanning.

72-148

CARR, H.A., TEMPLE, T.E., STAAB, E.V.

Early visualization of ^{99m}Tc -pertechnetate in metastatic thyroid cancer in a patient with Graves' disease.

J. Nucl. Med. 12 (1971), Jan., 40-2

N.S.A. 25 (1971), 13488

The dynamic serial studies of the Anger camera were superior to the static rectilinear scans in both delineation and resolution of metastatic thyroid lesion with pertechnetate.

72-149

DE VERNEJOU, P., RUFF, F., KELLERSHOHN, C.

Application of ^{99m}Tc for scintigraphic studies of pulmonary circulation.

Nucl. Med. 32 (1968), Suppl. 7, 95-101

N.S.A. 25 (1971), 11128

The use of ^{131}I -labelled macroaggregates of human serum albumin was compared with the use of ^{99m}Tc for scintigraphic studies of pulmonary circulation.

72-150

DI CHIRO, G.

Radioisotope cisternography, ventriculography and myelography.

Central Nervous System Investigation with Radionuclides Seminar, Miami, Fla, 19 Mar. 1970, 310-15

Charles E. Thomas (1971)

N.S.A. 25 (1971), 32483

Injections of ^{99m}Tc -albumin are used for cisternography and myelography. For radioisotope ventriculography, ^{99m}Tc -pertechnetate is injected directly into the ventricular cavities.

72-151

ECKELMAN, W., RICHARDS, P., HAUSER, W., ATKINS, H.

Technetium-labelled red ϕ blood cells.

J. Nucl. Med. 12 (1971), Jan. ϕ 22-4

N.S.A. 25 (1971), 13332

The preparation of ^{99m}Tc -labelled red blood cells in dogs and rabbits is described.

72-152

FICKEN, V., HALPERN, S., SMITH, C.Jr., MILLER, L., BOGARDUS, C.Jr.

^{99m}Tc -sulfur colloid macroaggregates. A new lung-scanning agent.

Radiology 97 (1970), Nov., 289-95

N.S.A. 25 (1971), 24232

^{99m}Tc sulfur colloid macroaggregates were prepared by modification of the method used to form ^{99m}Tc sulfur colloid, followed by glutaraldehyde stabilization of the radiopharmaceutical.

72-153

GREYSON, N.D., ROSENTHALL, L.

Detection of postoperative bronchopleural fistulas by radionuclide fog inhalation.

Can. Med. Ass. J. 103 (1970), Dec., 1366-8

N.S.A. 25 (1971), 26833

Bronchopleural fistulas may be demonstrated by inhalation of nebulized ^{99m}Tc -albumin observed by $\text{scintillation camera}$.

72-154

HUENERMANN, B., KLINK, R., AKHTAR, M., WENKLER, C.

Placentography: indications and comparative investigations about procedures in nuclear medicine.

Fortschr. Geb. Roentgenstr. Nuklearmed. 113 (1970), Oct., 472-9

N.S.A. 25 (1971), 13517

Results of placental localization were good with $^{99m}\text{Tc-Fe}^{3+}$ ^{99m}Tc -marked erythrocytes and ^{113m}In serum proteins. A scintillation camera was found to be superior to scanning with a mobile detector.

72-155

JOHNSON, A.E., GOLLAN, F.

^{99m}Tc -technetium dioxide for liver scanning.

J. Nucl. Med. 11 (1970), Sep., 564-5

N.S.A. 25 (1971), 4413

Uniform particles of $^{99m}\text{TcO}_2$ (about 0.5 micron in diameter) are obtained by chemical reduction of sodium pertechnetate.

72-156

KUBA, J., HUSAK, V., SEVEIK, M., KLAUS, E.

Comparison of ^{99m}Tc pertechnetate and ^{113m}In EDTA with respect to brain scintigraphy.

Fortschr. Geb. Roentgenstr. Nuklearmed. 112 (1970), Jun., 806-13

N.S.A. 25 (1971), 558

^{99m}Tc -pertechnetate is superior to ^{113m}In EDTA for brain scintigraphy.

72-157

LASSEN, N.A.

Intra-arterial methods for measurement or regional cerebral blood flow in man.

Central Nervous System Investigation with Radionuclides, Charles C. Thomas (1971), 194-202

N.S.A. 25 (1971), 32475

The blood flow in various brain regions can be measured by using intravascular tracers (^{99m}Tc -pertechnetate) or intra-arterial ^{133}Xe method and suitably placed external counters.

72-158

RICCABONA, G., MATHIE, F., LEITNER, E.

First results of lung function diagnostic methods in nuclear medicine.

Wien. Klin. Wochenschr. 82 (1970), 16 Oct., 765-9

N.S.A. 25 (1971), 19044

In this study, ^{99}Tc -labelled sulfur colloidal inhalation and intravenously injected ^{133}Xe were used to determine lung function.

2.11 - INDIUM-113 LABELLED COMPOUNDS

72-159

ABBATI, A., ROSSI, A., TURBA, E.

First remarks about ^{113m}In -DTPA in the study of the kidney.

Boll. Soc. Ital. Biol. Sper. 45 (1969), 15 Aug., 989-93

N.S.A. 25 (1971), 19039

The use of ^{113m}In -DTPA (diethylenetriaminopentacetic acid) in the study of the kidney was compared with the use of ^{197}Hg -chlormerodrin.

72-160

LEHOF, H., UMEK, H.

Spleen scintigraphy with ^{115m}In -labelled erythrocytes.

Blut 21 (1970), Sep., 162-7

N.S.A. 25 (1971), 19036

Simple preparation techniques for labelled erythrocytes are developed.

See also :

72-147 : Use of zirconium sulphate in the preparation of ^{113m}In and ^{99m}Tc -labelled albumin macroaggregates.

72-91 : Sequential scintigrams of the kidney with ^{131}I -o-iodohippuric acid and ^{113m}In -EDTA

72-154 : Placentography : indications and comparative investigations about procedures in nuclear medicine.

2.12 - MISCELLANEOUS LABELLED COMPOUNDS

72-161

ARONOW, S.

Brain scanning with positron emitters.

Amer. Lect. Ser. (1970), 771, 103-22

N.S.A. 25 (1971), 551

Positron-emitting isotopes that have been used for brain scanning include ^{47}V , ^{68}Ga , ^{18}F , ^{64}Cu , ^{72}As , ^{85}Zr , ^{124}I , and ^{74}As , which is used most frequently. The design features and electronic components of positron scanners and po-

sition camera are described.

72-162

BELETSKAYA, I.P., ZAKHARYCHEVA, I.I., KEBUTOV, O.A.

Electronilic substitution at the aromatic carbon atom. Isotopic exchange of pentafluorophenylmercury bromide with ^{203}Hg -labelled mercuric bromide in dimethyl sulfoxide and benzene.

Dokl. Akad. Nauk. SSSR 195 (1970), 1 Dec., 837-40

N.S.A. 25 (1971), 37370

The isotopic exchange of the pentafluoro-phenylmercury bromide with $^{203}\text{HgBr}_2$ in dimethyl sulfoxide (DMSO) was studied.

72-163

BOWEN, H.J.W.

Determination of calcium by radiochemical replacement.

Analyst 96 (1971), Mar., 220-2

N.S.A. 25 (1971), 28987

Calcium ions can be determined in solution by radiochemical replacement of ^{110}Ag in labelled solid silver oxalate, ^{60}Co in labelled cobalt-oxalate and ^{54}Mn in labelled oxalate.

72-164

COLOMBETTI, L.G., GOODWIN, D.A., TOGAMI, E.

^{68}Ga -labelled macroaggregates for lung studies.

J. Nucl. Med. 11 (1970), Dec., 704-7

N.S.A. 25 (1971), 11205

The preparation of sterile, pyrogen-free ^{68}Ga -labelled particles suitable for lung studies in humans was presented.

72-165

FELBER, J.

Chemical consequences of the nuclear reactions $^{58}\text{Fe}(n,\gamma)^{59}\text{Fe}$ and $^{57}\text{Co}(\text{BC})^{57}\text{Fe}$ in soluble Prussian Blue.

J. Chem. Soc. A (1970), 19, 3255-61

N.S.A. 25 (1971), 13068

The preparations of $\text{K}_4[\text{Fe}(\text{CN})_6]\cdot 3\text{H}_2\text{O}$ and $\text{KFe}[\text{Fe}(\text{CN})_6]\cdot \text{H}_2\text{O}$ labelled with ^{58}Fe in either the cation or the complex were described. 5% of the ^{59}Fe produced by neutron irradiation was retained in the hexacyano complex in Prussian Blue. In simple hexacyanide this percentage is 20%.

72-166

FRY, A.

Heavy atom isotope effects in organic reaction mechanism studies.

Isotope Effects in Chemical Reactions, Van Nostrand Reinhold Co. (1970), 364-414

N.S.A. 25 (1971), 37360

Heavy atom isotope effects in decarboxylation and decarboxylation reactions, displacement reactions, rearrangement reactions, reactions of carbonyl compounds, and miscellaneous reactions are reviewed.

72-167

GUETLICH, P., FROELICH, K., ODAH, S.

Polymeric chromium(III) complexes arising from the neutron irradiation of crystalline potassium chromate. I. Separation methods and some chemical properties of polynuclear recoil products.

J. Inorg. Nucl. Chem. 33 (1971), Feb., 307-16N.S.A. 25 (1971), 18486

A separation technique using cationic exchange was developed for the separation of various chromium complexes labelled with ^{51}Cr formed by neutron-irradiation of crystals of K_2CrO_4 .

72-168

HAKA, T., HIRATA, M., IIO, M., BABA, H.

Scintigraphy of lung cancer using ^{203}Hg pretreated with glutathione.

Nippon Kyobu Rinsho 29 (1970), Jul., 525-31N.S.A. 25 (1971), 26842

Mercuric chloride labelled with ^{203}Hg and mixed with glutathione gave better results in the scintillation scanning of the lungs.

72-169

KRANTZ, S., FIEDLER, H., OBER, M.

Zone-electrophoretic, chromatographic, and spectrographic investigations on fibrinogens of normal and cobalt-treated rabbits.

Acta Biol. Med. Ger. 25 (1970), 523-37N.S.A. 25 (1971), 21884

Radioelectrophoretic studies showed that $^{58}\text{Co}(\text{II})$ may bind with rabbit fibrinogen.

72-170

LUNDE, P.K.M., LICHTELSEN, K.

Determination of cortical blood flow in rabbit femur by radioactive microspheres.

Acta Physiol. Scand. 80 (1970), Sep., 39-44N.S.A. 25 (1971), 26577

The blood flow was determined by using ^{85}Sr -labelled plastic microspheres with a diameter of $15 \pm 5 \mu$ which were injected in a retrograde manner into the aorta.

72-171

MARSHALL, R.A.G., POLLARD, D.R.

Kinetic studies of exchange between metallic mercury and mercury compounds in solution. III.

J. Amer. Chem. Soc. 92 (1970), 18 Nov., 6723-8N.S.A. 25 (1971), 6308

The isotopic exchange of organo-mercury compounds with a metallic mercury surface was studied.

72-172

MATHUR, P.K., SENGUPTA, S.

Solid-state isotopic exchange in radio cobalt doped trisdipyridyl Co(III) perchlorate : effect of prior heat treatment.

Indian J. Chem. 6 (1968), Oct., 608-10

N.S.A. 25 (1971), 2191

Solid-state isotopic exchange during the process of hydration was studied in $^{58}\text{Co}^{2+}$ -doped trisdipyridyl Co(III) perchlorate. The effects of prior thermal treatment of the complex were discussed.

72-173

OKOAI, T., SHIOKAWA, T.

Chemical behavior of ^{60}Co in aqueous solutions of neutron-irradiated sodium ethylenediamine-tetraacetatocobaltate(III) tetrahydrate.

Radiochem. Radioanal. Lett. 5 (1970), 16 Oct., 37-42

N.S.A. 25 (1971), 2297

In the title compound, the recombination reaction of the recoil ^{60}Co atoms was investigated in aqueous solutions. The existence of ^{60}Co -labelled complexes other than EDTA complexes was suggested.

72-174

PHILIPSON, K., CALMER, P., SVEDBERG, J.

Tagging 7μ monodisperse polystyrene particles with ^{11}C .

Int. J. Appl. Radiat. Isotop. 21 (1970), Nov., 639-42

N.S.A. 25 (1971), 15993

Monodisperse particles of polystyrene were tagged with ^{11}C by irradiation with 50 MeV protons.

72-175

HALUSKY, J., KRONRAD, L., WALEK, P.,

VAVREJN, B., KOLC, J.

Process of improving the yields of radioactive fluorescein.

Canadian P. 865.137

N.S.A. 25 (1971), 32467

The yield of radioactive fluorescein obtained by reacting fluorescein with a radioactive Hg isotope is improved by adding to the mixture obtained the corresponding chemically pure non-radioactive fluorescein compound.

72-176

SHOAK, W.M., GILSON, A.J.

Scintillation of a vascular rim in subdural hematoma.

J. Nucl. Med. 11 (1970), Nov., 695-7

N.S.A. 25 (1971), 19059

The difference between findings in subdural hematomas studied with ^{203}Hg -chlormerodrin and with $^{99\text{m}}\text{Tc}$ -pertechnetate was discussed.

72-177

SEBVAČKOVÁ, V., KRIVÁNEK, M.

Dithizone as a stationary phase in reversed-phase chromatography used in activation analysis.

Proc. III. Analytical Chemical Conference, Budapest, August 24-29 (1970), 1, 121-5

N.S.A. 25 (1971), 31857

Dithizone was used as a chelate-forming agent adsorbed on a solid support to separate ^{59}Fe and ^{60}Co in a reversed-phase chromatographic process.

72-178

STILINOVIC, L.

^{65}Zn in serum proteins in persons exposed to zinc. Investigation in vitro.

Arh. Hig. Rađa Toksikol. 21 (1970), 23-6

N.S.A. 25 (1971), 29447

Blood serum proteins were labelled with ^{65}Zn . It was found that most of the ^{65}Zn was localized in the serum albumin and only a trace amount was associated with the globulins.

72-179

VANDEK LUGT, L.A., DIRKSE, T.P.

Exchange of ^{65}Zn between ZnO(s) and potassium zincate.

J. Electrochem. Soc. 118 (1971), Feb., 265

N.S.A. 25 (1971), 20978

The exchange of ^{65}Zn between solid ZnO and the complex zincate ion was studied by following the decrease in activity of the solution phase due to the uptake of ^{65}Zn by the ZnO . No significant exchange occurs over a period of 500 hrs.

72-180

WEST, J.B.

Lung circulation studies using radioactive gases.

Nucl. Medicine 22 (1968), Suppl. 7, 73-9

N.S.A. 25 (1971), 11125

Carbon dioxide labelled with ^{15}O and ^{133}Xe proved useful in the study of pulmonary circulation and ventilation.

72-181

ZAKHARYCHEVA, I.I., BELETSKAYA, I.P.,

REUTOV, O.A.

Electrophilic substitution on aromatic carbon atom. XIV. Kinetics of phenylmercurobromide isotopic exchange with $^{203}\text{HgBr}_2$ in benzene.

Zh. Org. Khim. 5 (1969), 2081-7

N.S.A. 25 (1971), 34600

The kinetics of isotopic exchange between phenylmercury bromide and $^{203}\text{HgBr}_2$ in benzene was studied at 20° to 50°C .

See also:

72-159: First remarks about $^{113\text{m}}\text{In}$ DPTA in the study of the kidney.

72-47: Distribution of trace impurities in sodium hydrates.

72-144: Renal scintigraphy with $^{99\text{m}}\text{Tc}$ iron ascorbate complex.

72-157: Intra-arterial methods for measurement of regional cerebral blood flow in man.

72-123: Isotope exchanges involving various isomorphous 6-molybdo and 6-tungsto heteropoly anions.

72-98: Study of regional lung function tests using the ^{131}I and ^{133}Xe double isotope tracer method.

72-158: First results of lung function diagnostic methods in nuclear medicine.

3 - RADIODECOMPOSITION, STABILITY, STORAGE

72-182

CATCH, J.R.

Stability of radioactive chemicals and drugs.

Int. Conf. Radioact. Isotop. Pharmacology, Geneva (1967), 19-42

N.S.A. 25 (1971), 23639

The mechanisms of radiolysis of complex organic compounds are discussed and the ways in which chemical decomposition can be re-

duced are considered.

72-183

EVANS, E.A., SHEPPARD, H.C., TURNER, J.C.

Validity of tritium tracers. Stability of tritium atoms in purines, pyrimidines, nucleosides and nucleotides.

J. Label. Compounds 6 (1970), Jan.-Mar., 76-87

The effect of pH and temperature on the stability of tritium atoms at various positions in the title compounds was discussed.

72-184

ROSENTHAL, P.N., FOX, M.S.

Effects of disintegration of incorporated ^3H and ^{32}P on the physical and biological properties of DNA.

J. Mol. Biol. 54 (1970), 28 Dec., 441-63

N.S.A. 25 (1971), 29459

Pneumococcal DNA was labelled with high specific activities of ^{32}P - or ^3H -labelled pyrimidines and stored at -30° in a casein hydrolysate medium. The kinetics of DNA strand scission was examined as a function of isotope disintegration.

See also:

72-62: Liquid tritioammonia as a tritiating agent.

4 - PURIFICATION, SEPARATION

72-185

ANONYMOUS

Stable gaseous isotope separation and purification: April-June 1970.

MLM-1753 (1970), 12 Nov., 51 pp.

N.S.A. 25 (1971), 13165

Research progress is described on carbon isotope separation by CO distillation, thermal diffusion, chemical exchange, Freon 11 distillation, liquid thermal diffusion, and conversion separation.

72-186

COHEN, Y.

Purity criteria and general specifications of radiopharmaceuticals.

Analytical Control of Radiopharmaceuticals IAEA, Vienna (1970), 1-30, STI/PUB-253, CONF-690725

N.S.A. 25 (1971), 6412

The useful purity criteria, i.e. radionuclide, radiochemical, and chemical purity are distinguished and explained.

72-187

MAJER, J., COHEN, E.P.

Separation by polyacrylamide gel electrophoresis of RNA from the

spleens of immunized mice.

Proc. Soc. Exp. Biol. Med. 136 (1971), Mar., 942-5

N.S.A. 25 (1971), 29476

RNA labelled by the incorporation of ^3H -uridine was separated by electrophoresis in polyacrylamide gels.

72-188

RATUSKY, J., KRONRAD, L., MALEK, P., VEVREJN, B., KOLE, J.

Method of purifying and separating derivatives of fluorescein series labelled with radioactive mercury isotopes.

B.P. 1.220.499

N.S.A. 25 (1971), 21151

This method comprises subjecting a crude mixture of the labelled derivative and at least one by-product to a chromatographic separation on an Al_2O_3 column followed by washings with water and dilute aqueous alkaline solution.

See also:

72-61: Tritiation of protein hormones.

72-62: Liquid tritioammonia as a tritiating agent.

5 - A N A L Y S I S

5.0 - GENERAL

72-189

ANONYMOUS

Analytical control of radiopharmaceuticals.

STI-PUB-253 (1970), Jul., 230 pp.

N.S.A. 25 (1971), 6259

Seventeen articles were presented at this panel on analytical control of radiopharmaceuticals held in Vienna, 7-11 July 1969.

72-190

BAKAY, L.

Radioisotopes in the study of the blood brain barrier and cerebral edema.

Amer. Lect. Ser. (1970), 771, 3-25

N.S.A. 25 (1971), 492

Autoradiography, electron microscopy and radioisotope scanning were used in the study of the blood brain barrier (^{36}Cl , ^{32}P), cerebral edema (^{131}I -serum albumin, ^{42}K , $^{35}\text{SO}_2$ and ^{32}P) and vascular lesions in human patients (^{131}I , ^{197}Hg -chlormerodrin, ^{99}Tc -pertechnetate or ^{68}Ga -edathamil).

72-191

BARUEL, J., MARQUES, R.O.

Use of electrophoresis in thin films for control of the radiochemical purity of tracer compounds.

CNEA-271 (1970), 11 pp.

N.S.A. 25 (1971), 2062

The radiochemical purity of labelled compounds can be checked by a thin-layer electrophoresis method.

72-192

CIPKA, J.

Radiochemical purity and stability of some radiopharmaceuticals.

Analytical Control of Radiopharmaceuticals, IAEA, Vienna (1970), 153-80, STI/PUB-253, CONF-690725

N.S.A. 25 (1971), 6387

Methods for determining the radiochemical purity and stability are presented for o-iodohippuric acid, diatrizoate, diiodofluorescein, Rose Bengal and oleic acid labelled with ^{131}I , as well as for radioactive chlormerodrin, colloidal radiogold, sodium phosphate, and chromate.

72-193

del VAL COB, M., REBOLLO, G.D.V., CASA, M.F.

Analytical control of radiopharmaceuticals by the Spanish Nuclear Energy Board (JEN).

Analytical Control of Radiopharmaceuticals, IAEA, Vienna (1970), 51-60, STI/PUB-253, CONF-690725

N.S.A. 25 (1971), 6268

The control of radiopharmaceuticals in the JEN is described.

72-194

FRUEHAUF, K.

Testing procedures for individual batches of radiopharmaceuticals.

Analytical Control of Radiopharmaceuticals, IAEA, Vienna (1970), 111-13
STI/PUB-253, CONF-690725

N.S.A. 25 (1971), 6385

Particle size distribution tests for radioactive gold colloids and albumin particle suspensions are described.

72-195

IYA, V.K., GOPAL, N.G.S.

Quality control of radiopharmaceuticals and its organizational aspects.

Analytical control of Radiopharmaceuticals, IAEA, Vienna (1970), 31-50, STI/PUB-253, CONF-690725

N.S.A. 25 (1971), 6267

Methods for the quality control of starting materials, and the radiopharmaceuticals obtained are reviewed.

72-196

KIM, Y.S.

Quality control and chemical analysis of radiopharmaceuticals at a small research centre.

Analytical Control of Radiopharmaceuticals, IAEA, Vienna (1970), 83-97, STI/PUB-253, CONF-690725

N.S.A. 25 (1971), 6276

Chromatographic techniques (including paper, thin-layer and ion exchange) proved to be simple and effective means for studying radiopharmaceuticals.

72-197

KIMURA, Y., MORISHIMA, H.,
KOGA, T., KAWAI, H., HONDA, Y.

Studies of the behavior and distribution of radioactive substances in coastal and estuarine waters.

Kinki Daigaku Genshiryoku Kenkyusho Nenpo 7 (1968), 21-31

N.S.A. 25 (1971), 34760

The variation of concentration of low-level liquid radioactive wastes contained in coastal and estuarine waters was investigated with the tidal change.

72-198

MITTA, A.E.A., RADICELLA, R.

Methods of testing radiopharmaceuticals used by the Argentine National Atomic Energy Commission (CNEA).

Analytical Control of Radiopharmaceuticals, IAEA, Vienna (1970), 61-2, STI/PUB-253, CONF-690725
N.S.A. 25 (1971), 6269

The chemical, physical and biological methods for testing radiopharmaceuticals used by the CNEA are listed.

72-199

NUSYNOWITZ, M.L., GOLDSMITH, W.A.,
WALISZEWSKI, J.A., MUSARRA, J.S.

System for computer processing of radiopharmaceutical disbursement information.

Amer. J. Roentgenol. Radium Ther. Nucl. Med. 111 (1971), Jan., 191-4
N.S.A. 25 (1971), 19050

Preparation of inventories, computation of workloads, and maintenance of patient dosage records can be processed by a computer.

72-200

QUINN III, J.L.

Role of the hospital radiopharmacy.

Analytical Control of Radiopharmaceuticals, IAEA, Vienna (1970), 99-109, STI/PUB-253, CONF-690725
N.S.A. 25 (1971), 6384

Current practices in the Chicago Wesley Memorial Hospital are reviewed.

72-201

SORANTIN, H.

Analytical control of radiopharmaceuticals in the department of chemistry, Reactor Centre, Seiberödorf.

Analytical Control of Radiopharmaceuticals, AIEA, Vienna (1970), 69-81, STI/PUB-253, CONF-690725
N.S.A. 25 (1971), 6286

Control procedures for target materials and processed radiopharmaceuticals are described.

72-202

STEINNES, E.

Analytical control of radiopharmaceuticals in Norway.

Analytical Control of Radiopharmaceuticals, AIEA, Vienna (1970), 63-8, STI/PUB-253, CONF-690725
N.S.A. 25 (1971), 6270

The equipment and methods used in Norway for radiopharmaceuticals control are described.

72-203

TOELGYESSY, J.

Radiometric titration of inactive and radiopharmaceuticals.

Analytical Control of Radiopharmaceuticals, AIEA, Vienna (1970), 201-12, STI/PUB-253, CONF-690725
N.S.A. 25 (1971), 6279

Both inactive and radiopharmaceuticals can be analyzed by radiometric end-point detection.

72-204

VAN DER BORGHT, O.

Basic nuclear aspects of auto-historadiography (with suggestions concerning color autoradiography).

Acta Histochem. Suppl. (1968), 8, 15-21

N.S.A. 25 (1971), 4416

5.1 - DETERMINATION OF ACTIVITY

72-205

BIRK, J., FEHLER, I.

Quantitative autoradiography of Zr-T particles.

KFKI-70-26-HP (1970), 6 pp.

N.S.A. 25 (1971), 10775

The incorporation of tritium gas during the use and preparation of Zr-T targets for neutron production was investigated by the quantitative autoradiography of Zr-T particles.

72-206

BRANSOME, E.D.Jr., GROWER, E.F.

Liquid scintillation counting of (^3H) and (^{14}C) on solid supports : a warning.Anal. Biochem. 38 (1970), Dec., 401-8N.S.A. 25 (1971), 28985

^3H counting or ^3H and ^{14}C counting of samples on solid supports are not reliable unless : 1) Precise standards which exactly reproduce very constant counting conditions are employed. 2) The samples are eluted from the support - the addition of the same compound labeled with another isotope often being necessary. 3) The samples are subjected to oxygen flask combustion.

72-207

BRANSOME, E.D.Jr.

Current status of liquid scintillation counting.

Symposium held at Cambridge, Ma., Mar. 31 - Apr. 3, 1969. CONF-690346 Grune and Stratton, New York (1970), 411 pp.

N.S.A. 25 (1971), 4358

New developments of the liquid scintillation process are discussed.

72-208

BUCKLEY, J.P.

Use of ^{14}C as a secondary counting standard for ^{35}S .Int. J. Appl. Radiat. Isotop. 22 (1971), Jan., 41-2N.S.A. 25 (1971), 18364

The use of ^{14}C as a secondary counting standard was found to be a useful practical procedure for work of moderate precision.

72-209

CLARKSON, T.W., GRUBERWOOD, M.R.

Selective determination of inorganic mercury in the presence of organomercurial compounds in biological material.

Anal. Biochem. 37 (1970), Oct., 235-43N.S.A. 25 (1971), 2109

The principle of the title method is the selective reduction of inorganic mercury by SnCl_2 to elemental vapor which is collected on Hopcalite where the radioactivity is measured by γ scintillation counting.

72-210

FIGDOR, S.K.

Automated calculation of ^{14}C and ^{35}S radioactivity in biological samples by external standardization and a computer program.Comput. Biomed. Res. 3 (1970), June, 201-11N.S.A. 25 (1971), 26184

An automatic external standardization procedure to estimate quench and to simplify the process of converting observed radioactivity into corrected true radioactivity has been developed.

72-211

GALATZEANU, I.

Possible artifacts in the chromatographical determination of radio-

chemical purity of ^{35}S - and ^{75}Se -labelled methionine.

Analytical Control of Radiopharmaceuticals, IAEA, Vienna (1970), 189-39
STI/PUB-253, CONF-690725

N.S.A. 25 (1971), 6271

The radiochemical purity of ^{75}Se -labelled selenomethionine was tested by paper and thin-layer chromatography in nitrogen atmosphere and in air.

72-212

GILCK, H.

Methods for the determination of the radioactivity of samples, double-labelled with tritium, or ^{14}C .

Isotopenpraxis 6 (1970), Sep., 310-16

N.S.A. 25 (1971), 12953

The radioactivity of tritium- or ^{14}C -labelled material can be determined on chromatographic or pherographic paper and by using a liquid scintillation spectrometer. This method provides counting of double-labelled samples with a T-to- ^{14}C ratio of 1/2 as a maximum.

72-213

HEUSER, J., MILEDI, R.

Autoradiography of labelled amino acids injected iontophoretically into the giant squid synapse.

J. Physiol. 208 (1970), June, 55P-7

N.S.A. 25 (1971), 4418

The location of protein synthesis sites was studied by autoradiography of labelled aminoacids.

72-214

ISAACS, S.R.

Determination of ^{65}Zn in Lucas Heights effluent.

AAEC/TM-569 (1970), Oct., 14 pp.

N.S.A. 25 (1971), 31829

Quantitative determination of ^{65}Zn in effluent is obtained by ex-

traction of ^{65}Zn from a concentrate of effluent in HCl using Aliquat-336 in xylene, followed by gamma spectrometry using an NaI(Tl) crystal.

72-215

JOHNS, F.B., JAQUISH, R.E.

Analysis of atmospheric gases.

AEC Air Cleaning Conference, Richmond, 31 Aug. 1970. CONF-700816 2 (1970), 683-96

N.S.A. 25 (1971), 20928

The Southwestern Radiological Health Laboratory collects and analyses the gaseous radionuclides that are present in the atmosphere (Xe, H_2O , Kr, CO_2 and Ra).

The samplers and counters are described.

72-216

KIM, S.K., YANG, K.R.

Radiocarbon dating.

Hwahak Kwa Kongop U1 Chinbo 2 (1969), 3, 203-9

C.A. 73 (1970), 27750

The CO_2 is converted into C_6H_6 and the activity is measured with a liquid scintillation counter.

72-217

KRATZER, K.

Radiochemical determination of traces of antimony by isotope exchange reaction in the organic phase.

Radiochem. Radioanal. Lett. 5 (1970), 16 Oct., 69-74

N.S.A. 25 (1971), 2106

This new radioanalytical method is based on the homogeneous exchange reaction between antimony(III) iodide and labelled antimony(III) diethyldithiocarbamate in carbon tetrachloride.

72-218

LONGIN, R.

New method of collagen extraction for radiocarbon dating.

Nature 230 (1971), 26 Mar., 241-2

N.S.A. 25 (1971), 37312

In the radiocarbon dating of bones, pure collagen can be obtained by extraction with slightly acid hot water after treatment of crushed bones with 8% HCl. The extracted pure gelatin can either be burnt to form the gas sample or dissolved in a suitable solvent before counting.

72-219

MELLISH, C.E.

Limits of accuracy in the determination of purity by thin-layer and paper chromatography.

Analytical Control of Radiopharmaceuticals, IAEA, Vienna (1970), 115-25
STI/PUB-253, CONF-690725

N.S.A. 25 (1971), 6277

Accurate background

determination is an important factor for the accuracy with which a purity figure can be derived from a paper or thin-layer chromatogram of a radioactive substance.

72-220

MITTA, A.E.A.

Determination of free ^{99m}Tc in labelled compounds by means of thin-layer chromatography.

Int. J. Appl. Radiat. Isotop. 22 (1971), Mar., 223-5

N.S.A. 25 (1971), 28991

The radiochemical purity of ^{99m}Tc -labelled radiopharmaceuticals can be checked by a simple and rapid method using thin-layer chromatography and a scintillation camera.

72-221

MODESTOV, V.K., MIRKHODZHAEV, A.Kh.

Importance of kinetic labelled compounds for the functional assessment of the liver.

Med. Radiol. 15 (1970), 10, 37-40

N.S.A. 25 (1971), 16240

Mathematical kinetic models of radiopharmaceuticals (Rose Bengal and col-

loidal particles) can be employed for separate quantitative evaluation of the activity of hepatic cells and hepatic circulation.

72-222

COSTRIN, J., ROUQUIE, A.

Preparation of whole blood samples for ^{14}C counting in liquid scintillator.

Int. J. Appl. Radiat. Isotop. 21 (1970), Dec., 739-41

N.S.A. 25 (1971), 15524

The use of dimethyl sulphoxide to denature haemoglobin in the hydrogen peroxide method of bleaching blood improves the efficiency of liquid scintillation counting.

72-223

PETERKOPSKY, B., DIEGELMANN, R.

Use of a mixture of proteinase-free collagenases for the specific assay of radioactive collagen in the presence of other proteins.

Biochemistry 10 (1971), 16 Mar., 988-94

N.S.A. 25 (1971), 28997

Radioactive collagen may be quantitatively measured even in the presence of large amounts of other proteins by a new assay procedure which makes use of bacterial collagenase to cleave the collagen into acid-soluble peptides.

72-224

PIEPGRAS, U., VOETS, P.

Scintigraphic detection of pathological processes within the spinal cord space following intravenous administration of radioisotopes: intravenous myeloscintigraphy.

Fortschr. Geb. Roentgenstr. Nuklearmed. 113 (1970), Sep., 329-36

N.S.A. 25 (1971), 19042

Experience with intravenous myeloscintigraphy following intravenous injection of radioactive substance is described.

72-225

KOSS, P.J., MARTIN, A.E.

Rapid procedure for preparing gas samples for ^{15}N determination.

Analyst 95 (1970), Sep., 817-22N.S.A. 25 (1971), 23

In this method, ammonium sulphate is converted into nitrogen gas for isotopic analysis in a mass spectrometer.

72-226

SCHMIDT, H.A.E.

Examination of the distribution pattern of labelled drugs.

Strahlentherapie, Sonderbände 67 (1968), 353-64N.S.A. 25 (1971), 6629

The distribution pattern of labelled drugs may be studied by several methods: whole-body autoradiography, analysis of the blood level, chromatographic methods. Microautoradiographic studies also give relevant information.

72-227

SISSON, W.B., OLDENDORF, W.H., CASSEN, B.

Liquid scintillation counting of $^{113\text{m}}\text{In}$ conversion electrons in the presence of ^3H and ^{14}C .

J. Nucl. Med. 11 (1970), Dec., 749-52N.S.A. 25 (1971), 8213

The high energy $^{113\text{m}}\text{In}$ conversion electrons are counted in the external standard pulse-height window set too high to record ^{14}C or ^3H emissions.

72-228

SMITH, J.G.

Study of the exchange equilibria between methylacetylene-d and water by mass spectrometry.

CU-755-7 Sect. 3, 104 pp.

N.S.A. 25 (1971), 8241

The single-stage separation factor, α , was determined from mass spectrophotometric analyses. Procedures developed for the analysis of deuterated methylacetylene were used for analysis of deuterium content of water.

72-229

SWITZER, B.K., SUMMER, G.K.

Improved method for hydroxyproline analysis in tissue hydrolyzates.

Anal. Biochem. 39 (1971), Feb., 487-91N.S.A. 25 (1971), 28995

Hydroxyproline radioactivity and content from only 1 mg of hydrolyzed tissue protein were measured by modified procedures of Juva and Prockop and of Kivirikko, Laitinen, and Prockop.

72-230

SYROEZHKO, A.M., SOLIVANOV, N.T., POTEKIN, V.M., PROSKURYAKOV, V.A., LUSAKIN, A.P.

Radiochromatographic method for analysis of the aliphatic acids $\text{C}_2\text{-C}_8$ and isomeric decanes labelled with ^{14}C .

Radiokhimiya 12 (1970), 675-80N.S.A. 25 (1971), 20934

The title method can be used to investigate the kinetics of the consumption of labelled products in the oxidation of hydrocarbons.

5.2 - APPARATUS

72-231

ASHKENAZI, Y., CARL, I.

On-line computer system in a low-level counting laboratory.

Nucl. Instrum. Methods 89 (1970), 125-30N.S.A. 25 (1971), 10833

A system based on a small general purpose digital computer (PDP-8/S) and a special interface has been developed to provide on-line data acquisition and analysis from four tritium and ^{14}C experiments.

72-232

BIRYULIN, Yu.F., KOLESNIKOV, N.V.

Stabilization of the gain of a scintillation counter for registering ^{14}C

Instrum. Exp. Tech. 4 (1970), Jul.-Aug., 1069-70

N.S.A. 25 (1971), 29344

The stabilization of the amplification channel in the scintillation counter designed for registering a soft β -ray ^{14}C source was studied.

72-233

CLARK, B.C.

System for $^{14}\text{CO}_2$ radioassay in the presence of a high background radiation.

Nucl. Instrum. Methods 89 (1970), 225-31

N.S.A. 25 (1971), 10843

The detection system consists of a 30 cm³ spherical proportional counter built inside a plastic scintillator. This counter which measures the beta rays from ^{14}C -labelled gas has been designed for possible use on a Mars mission.

72-234

HELLEINER, C.W., WUNNER, W.H.

Simple method for counting ^{14}C - and ^3H -proteins in polyacrylamide gels.

Anal. Biochem. 39 (1971), Feb., 333-8

N.S.A. 25 (1971), 28994

Slices of gels are treated with aqueous NH_4OH on glass fiber discs which are then dried and counted in a toluene-PPO-POPOP scintillant.

72-235

KIKIN, I.S., ISUPOV, V.K., GUSEV, Yu.K.

Utilization of thin-layer chromatography for separation of xenon trioxide from the oxygen-containing compounds of iodine.

Radiokhimiya 12 (1970), 500-5

N.S.A. 25 (1971), 15693

Thin-layer chromatography was investigated for preparative removal of trace amounts of labelled xenon-trioxide from oxygen-containing iodine compounds and for rapid monitoring of its radiochemical purity.

72-236

KHANZLER, J.K., VOLLERT, J.M., HARPER, P.V.

Diagnostic value of hepatic pliability as assessed from inspiration and expiration views on the gamma camera.

Radiology 97 (1970), Nov., 323-6

N.S.A. 25 (1971), 24237

Anterior views of the liver can be produced by using multimillicurie amounts of $^{99\text{m}}\text{Tc}$ sulfur colloid and the Anger camera.

72-237

EUNDSCHENK, H., FISCHER, J., WOLF, R.

Hemodynamic function studies.

Int. J. Appl. Radiat. Isotop. 21 (1970), Aug., 471-85

N.S.A. 25 (1971), 11184

Simultaneous measurement of radioactivity at several sites of the body and the observation of very fast hemodynamic processes were made possible by using a multichannel function test device.

72-238

PALAIS, C.J.

Applications of the liquid scintillation spectrometer to radioecology. Emphasis is placed on the detection of Cherenkov radiation of beta-emitting nuclides.

Symp. Intern. Radiocologie 1 (1970),
201-12, CONF-690918

N.S.A. 25 (1971), 2555

The general advantages of liquid scintillation spectrometer and Cerenkov counting, and some details on sample preparation and counting efficiency are discussed.

72-239

PAVONI, P., HURLEY, P.J., STRAUSS, H.W., LANGAN, J.K., WAGNER, H.N.Jr.

Pinhole scintillation camera and ^{99m}Tc pertechnetate in normal thyroid scanning.

Acta Isotop. 10 (1969), 15 Dec., 139-47

N.S.A. 25 (1971), 29586

Thyroid scintigram studies were carried out by means of a Pho-gamma/III equipped with a pinhole collimator and using ^{99m}Tc -pertechnetate.

72-240

PFEFFER, A., WEINSTEIN, S., GAYLORD, J., INDINDOLLI, L.

Rapid procedure for liquid scintillation counting of animal tissues using a nitric acid digestion procedure and a dioxane-based scintillator.

Anal. Biochem. 39 (1971), Jan., 46-53

N.S.A. 25 (1971), 15529

In this procedure, the solvent consists of 1% [2-(4'-tert-butylphenyl)-5-(4"-biphenyl)-1,3,4-oxadiazole] and 6% naphthalene in dioxane. This solvent can hold up to 4,5 ml of H_2O per 10 ml of solvent.

72-241

PRYDZ, S., KOREN, J.F., MELO, T.B.

Electron-induced luminescence in radiation standards of tritium and radio-carbon in acryl plastics.

Int. J. Appl. Radiat. Isotop. 21 (1970), Oct., 629-30

N.S.A. 25 (1971), 15889

A method of reducing the unwanted light effect in autoradiography when using polymethylmethacrylate standards is suggested.

72-242

SCHENCK, P., LANGE, D., SCHNABEL, K.

Sequential use of the Anger camera in double-tracer studies.

Nucl. Med. 9 (1970), 30 Jan., 120-8

N.S.A. 25 (1971), 10928

A modified Anger camera was used to register two simultaneously administered radioisotopes: ^{99m}Tc -pertechnetate and ^{113m}In . In for the diagnosis of tumor metastases or ^{131}I -hippuric acid and ^{68}Ga -EDTA for evaluation of glomerular damage.

72-243

SCHENCK, P., ZUM WINKEL, K., MAIER-BORST, W., SZEGVARI, M.

Angiocardiography with a scintillation camera.

Nucl. Med. 32 (1968), Suppl. 7, 31-4

N.S.A. 25 (1971), 11121

Injection of ^{99m}Tc -pertechnetate into the cubital vein and an Anger camera were used to differentiate simultaneously activities in the right heart, the left heart and the aorta. The patient was positioned at a 45° angle with the left side of the thorax nearer to the Anger camera.

72-244

SHARKIS, A.A., PAEDA, R.I.

Teflon and aluminum cells with windows for liquid scintillation detectors.

Instrum. Exp. Tech. 2 (1970), Mar.-Apr., 407-8

N.S.A. 25 (1971), 18666

The design and properties of Teflon and aluminum cells with cemented windows are described. These

cells are designed for liquid scintillation detectors used to detect ^{60}Co and ^{204}Tl .

72-245

WARD, S., WILSON, D.L., GILLIAM, J.J.

Methods for fractionation and scintillation counting of radioisotope-labelled polyacrylamide gels.

Anal. Biochem. 38 (1970), Nov., 90-7

N.S.A. 25 (1971), 10478

This rapid method of preparing gel fractions for liquid-scintillation counting allows high efficiency counting of both ^3H and ^{14}C and does not require degradation of the gel prior to counting.

72-246

WILCOX, F.W., RIPPLE, R.C., MCHENRY, M.M., EDGAR, W.H.

Full-size scintiphography in pericardial effusion diagnosis.

J. Nucl. Med. 12 (1971), Mar., 134-5

N.S.A. 25 (1971), 24251

The Cinto-Photo Enlarger Attachment was used on an Anger scintillation camera to produce full-size x-ray scintigraphs which were superimposed and observed on an x-ray film viewer for spatial evaluation.

72-247

WONG, K.Y.

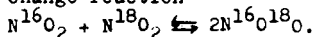
Fast gas-phase isotopic exchange reactions in nitrogen oxides.

Toronto, Univ. of Toronto (1969)

N.S.A. 25 (1971), 8255

A fast flow gas phase tubular reactor was designed and constructed in the ion source of a mass spectro-

meter to study the kinetics of the very fast oxygen self-exchange reaction



See also:

72-145: Determination of cardiac output by radioisotope angiography and the image-intensifier scintillation camera.

72-154: Placentography indications and comparative investigations about procedures in nuclear medicine.

5.3 - DEGRADATION

72-248

DJORDJEVIC, N., HUDNIK-PLEVNIK, T.A.

In vitro degradation of deoxyribonucleic acid by crude extracts from *Salmonella typhimurium* and *Escherichia coli* B/r.

Int. J. Radiat. Biol. 17 (1970), 493-6

N.S.A. 25 (1971), 498

The degradation of irradiated ^{14}C DNA by crude extracts from *S. typhimurium* and *E. coli* B/r was studied.

72-249

SKINNER, G.B., SWEET, R.C., DAVIS, S.K.

Shock tube experiments on the pyrolysis of deuterium-substituted ethylenes.

J. Phys. Chem. 75 (1971), 7 Jan., 1-12

N.S.A. 25 (1971), 12993

The pyrolysis of deuterium-substituted ethylenes (C_2H_4 , $\text{C}_2\text{H}_3\text{D}$ + $\text{C}_2\text{D}_3\text{H}$, trans-1,2- $\text{C}_2\text{H}_2\text{D}_2$, and $\text{C}_2\text{H}_2\text{D}_2$ + D_2) in argon was studied in a single-pulse shock tube.

6 - MISCELLANEOUS

72-250

ANONYMOUS

Health physics practices and experiences of isotope producers and distributors.

NP-18791 (1970), Sep., 5 pp.

N.S.A. 25 (1971), 29527

Health physics practices of 26 commercial producers and distributors of radiation sources and radioisotope-labelled chemicals, compounds, and pharmaceuticals in the USA are described.

72-251

LADNER, H.A.

Safety principles in the handling of radiopharmaceuticals and radioisotope-labelled pharmaceuticals.

Strahlenschutz-Forsch. Prax. 9
(1969), 20-8N.S.A. 25 (1971), 35153

The fact that a physician should not only know the properties of radiopharmaceuticals but also their quality standard is discussed.

72-252

MIRKHODZHAEV, A.Kh.

Radiation doses in the use of radioisotope methods in the study of the liver function.

Med. Radiol. 15 (1970), 7,
38-43N.S.A. 25 (1971), 527

The maximal permissible dose for labelled Rose Bengal comprises about 150 μC , radioactive colloidal gold 6 μC , labelled particles of human serum albumin 170 μC .

72-253

RICHTER, D., BIKKIGT, W.,
ALBRECHT, L.

Illustration of the specifications for the transport of radioactive materials of high activity and fissionable materials. Principles of criticality safety in the transport of fissionable materials.

SZS-19/70 (1970), Sep., 34 pp.

N.S.A. 25 (1971), 13194

Regulations for the transport of highly radioactive and fissile materials in East Germany are described.