



# CONTENTS

## DISTRIBUTION OF TRITIUM (Session 1 and Session 2, Part 1)

Atmospheric HT and HTO: V. Distribution and large-scale circulation (IAEA-SM-232/62) .....	3
<i>A.S. Mason, H.G. Östlund</i>	
Discussion .....	16
Evidence of pulsed discharges of tritium from nuclear energy installations in Central European precipitation (IAEA-SM-232/18) .....	17
<i>W. Weiss, J. Bullacher, W. Roether</i>	
Discussion .....	30
Artificial tritium fall-out at the South Pole (IAEA-SM-232/38) .....	31
<i>J. Jouzel, M. Pourchet, C. Lorius, L. Merlivat</i>	
Discussion .....	46
Distribution and reactions of tritiated hydrogen and methane (IAEA-SM-232/54) .....	47
<i>L.L. Burger</i>	
Discussion .....	63
Tritium pollution in the Swiss luminous compound industry (IAEA-SM-232/11) .....	65
<i>K. Krejčí, A. Zeller, Jr.</i>	
Discharges of tritium to the environment from unrestricted use of consumer products containing this radionuclide (IAEA-SM-232/9) .....	79
<i>G. Wehner</i>	
Large-scale distribution of tritium in a commercial product (IAEA-SM-232/57) .....	93
<i>F. Combs, R.J. Doda</i>	
Discussion .....	101

## EVALUATION OF FUTURE DISCHARGES (Session 2, Part 2)

Production and emission of tritium from nuclear facilities, and the resulting problems (IAEA-SM-232/12) .....	105
<i>H. Bonka</i>	
Discussion .....	122

An analysis of tritium releases to the atmosphere by a controlled thermonuclear reactor (IAEA-SM-232/51) .....	125
<i>T.J. Bander, D.S. Renne, W.F. Sandusky</i>	
Laser fusion: Status, future and tritium control (IAEA-SM-232/102).....	139
<i>P.E. Coyle</i>	
Discussion .....	153

### MEASUREMENT OF TRITIUM (Session 3, Part 1)

HT-HTO Sampling at the Nevada Test Site (IAEA-SM-232/87) .....	157
<i>R.J. Straight</i>	
Discussion .....	161
A low-background liquid scintillation counter for measuring low-level tritium (IAEA-SM-232/32) .....	163
<i>T. Iwakura, Y. Kasida, Y. Inoue, N. Tokunaga</i>	
Discussion .....	171
A rapid and quantitative method to determine the tritium content in DNA from small tissue samples (IAEA-SM-232/7) .....	173
<i>V. Kasche, R. Zöllner, H. Amneus, L. Näslund</i>	
Discussion .....	182

### TRITIUM IN THE AQUATIC ENVIRONMENT (Session 3, Part 2, Session 4 and Session 5, Part 1)

Transfer and incorporation of tritium in aquatic organisms (IAEA-SM-232/96) .....	187
<i>R. Kirchmann, S. Bonotto, S.D. Soman, T.M. Krishnamoorthy, T.S. Iyengar, A.A. Moghissi</i>	
Discussion .....	203
Microbial activity measurements by means of tritium-labelled substrates (IAEA-SM-232/5) .....	205
<i>H.-G. Hoppe</i>	
Discussion .....	218
Incorporation of tritium into planctonic algae in a continuous culture under dynamic conditions (IAEA-SM-232/40).....	219
<i>S. Strack, G. Kistner, C.C. Emeis</i>	
Tritium behaviour in aquatic plants and animals in a freshwater marsh ecosystem (IAEA-SM-232/50) .....	231
<i>L.W. Adams, T.J. Peterle, G.C. White</i>	
Discussion .....	244

Distribution of tritium in a chronically contaminated lake (IAEA-SM-232/74) .....	247
<i>B.G. Blaylock, M.L. Frank</i>	
Discussion .....	256
Monitoring for the dispersion of discharged tritium in sea-water around the Tokai-mura fuel reprocessing plant (IAEA-SM-232/27) .....	257
<i>T. Nomura, Y. Kishimoto, A. Hirayama, S. Fukuda, K. Iwasaki</i>	
Discussion .....	269
Tritium in the Savannah River estuary and adjacent marine waters (IAEA-SM-232/80) .....	271
<i>D.W. Hayes</i>	
Discussion .....	281
An assessment of the radiological impact of tritium released to sea from the Windscale fuel element reprocessing plant (IAEA-SM-232/10) .....	283
<i>J.A. Hetherington, J.C. Robson</i>	
Discussion .....	300
Oceanic distribution and transport of tritium (IAEA-SM-232/67) .....	303
<i>H.G. Östlund, R.A. Fine</i>	
Discussion .....	312
Tritium in the North Atlantic Ocean: Inventory, input and transfer into deep water (IAEA-SM-232/98) .....	315
<i>W. Weiss, W. Roether, E. Dreisigacker</i>	
Discussion .....	335

**TRITIUM IN THE TERRESTRIAL ENVIRONMENT (Session 5,  
Part 2, and Sessions 6 and 7)**

Transfer and uptake mechanism of tritium in soil (IAEA-SM-232/95) .....	339
<i>J. K. Miettinen</i>	
Discussion .....	347
Transfer of tritiated water vapour to and from land surfaces (IAEA-SM-232/3) .....	349
<i>J.A. Garland</i>	
Discussion .....	358
Environmental transport and cycling of tritium in the vicinity of atmospheric releases (IAEA-SM-232/80) .....	361
<i>C.E. Murphy, Jr., M.M. Pendergast</i>	
Discussion .....	372

Influence of the rate of conversion of HT to HTO on projected radiation doses from release of molecular tritium (IAEA-SM-232/81) .....	373
<i>D.G. Jacobs, C.E. Easterly, J.E. Phillips</i>	
Discussion .....	382
Behaviour of tritium in the plant domain (IAEA-SM-232/100) .....	385
<i>T.M. Krishnamoorthy, T.S. Iyengar, S.D. Soman, G. Solis de Bravo, J.R. Ortiz Magana, C. Archundia, L.L. Martinez de Alva, R.M. de Nulman, N.B. Juan, A. Yuthamanop</i>	
Environmental tritium in trees (IAEA-SM-232/44) .....	405
<i>R.M. Brown</i>	
Discussion .....	417
Transfert à la ration alimentaire du tritium émis par les installations nucléaires (IAEA-SM-232/99) .....	419
<i>P. Bovard, J. Delmas, Y. Belot, H. Camus, A. Grauby, R. Kirchmann, J. Van den Hoek</i>	
Discussion .....	431
Transfer and incorporation of tritium in mammals (IAEA-SM-232/48).....	433
<i>J. Van den Hoek, R. Kirchmann, N.B. Juan</i>	
Discussion .....	444
Transfer of tritium to foetuses and newborns from mother mice administered with tritiated water (IAEA-SM-232/34) .....	445
<i>Y. Ueno, S. Nakamura, T. Takahashi, H. Aiba</i>	
Métabolisme de molécules tritiées chez le rat: Etude sous l'angle de la radioprotection (IAEA-SM-232/39) .....	453
<i>L. Jeanmaire, Y. Vernois</i>	
Discussion .....	462
Radiation dosimetry in experimental animals exposed to tritiated water under different conditions (IAEA-SM-232/78) .....	463
<i>R.B. Cumming, G.A. Sega, M.F. Walton</i>	
Discussion .....	468
Tritium distribution and incorporation from tritiated water or tritiated precursors of DNA, RNA or proteins (IAEA-SM-232/63) .....	469
<i>D.J. Mewissen, M.E. Furedi, A.S. Ugarte, J.H. Rust</i>	
Discussion .....	487
Induction of specific-locus mutations in the mouse by tritiated water (IAEA-SM-232/85) .....	489
<i>W.L. Russell, R.B. Cumming, E.M. Kelly, E.L. Phipps</i>	
Discussion .....	496

## TRITIUM IN MAN (Session 8 and Session 9, Part 1)

Biological half-life of tritium in humans (IAEA-SM-232/65).....	501
<i>A. A. Moghissi</i>	
Discussion .....	505
Diffusion kinetics of tritiated water through human skin (IAEA-SM-232/43) .....	509
<i>R. V. Osborne</i>	
Models for assessing the environmental exposure by tritium released from nuclear installations (IAEA-SM-232/15).....	521
<i>K.J. Vogt</i>	
Discussion .....	534
Environmental transport and long-term exposure for tritium released in the biosphere (IAEA-SM-232/47) .....	535
<i>R. Bergman, U. Bergström, S. Evans</i>	
Methodology for hazard assessment of environmental tritium (IAEA-SM-232/4) .....	555
<i>J. Gruber, A. A. Moghissi</i>	
Discussion .....	566
Tritium distribution in man and his environment (IAEA-SM-232/75).....	567
<i>D. C. Bogen, G. A. Welford, C. G. White</i>	
Discussion .....	573
World-wide population doses from tritium released from nuclear facilities (IAEA-SM-232/69) .....	575
<i>J. K. Soldat, D. A. Baker</i>	
Discussion .....	582
Tritium in the environment—NCRP Report No.62 (IAEA-SM-232/101) .....	585
<i>M. Eisenbud, B. Bennett, R. E. Blanco, E. L. Compere, E. Goldberg,     D. G. Jacobs, J. Koranda, A. A. Moghissi, J. Rust, J. K. Soldat</i>	
Discussion .....	588

## MONITORING OF TRITIUM (Session 9, Part 2, and Session 10)

Impact on the environment of tritium releases from the Karlsruhe Nuclear Research Center (IAEA-SM-232/2) .....	591
<i>L. A. König</i>	
Discussion .....	610
Monitoring experiences with tritium in JAERI (IAEA-SM-232/30) .....	613
<i>Y. Yoshida, A. Yabe, M. Kishida</i>	
Discussion .....	621

Environmental aspects of tritium from CANDU station releases (IAEA-SM-232/49) .....	623
<i>D.J. Gorman, K. Y. Wong</i>	
Discussion .....	633
Tritium monitoring at the Sandia Tritium Research Laboratory (IAEA-SM-232/56) .....	635
<i>T.K. Devlin</i>	
Discussion .....	651
Transport through a trench cover of gaseous tritiated compounds from buried radioactive wastes (IAEA-SM-232/60).....	655
<i>A.H. Lu, J.M. Matuszek</i>	
Discussion .....	669
Fifteen years of experience in handling tritium problems in connection with low-energy particle accelerators (IAEA-SM-232/8) .....	671
<i>P.F. Sauermann, W. Friedrich, J. Knieper, H. Printz</i>	
Discussion .....	685
List of Chairmen of Sessions and Secretariat of the Symposium .....	687
List of Participants .....	689
Author index .....	709

