MARTIN MARIETTA ENERGY SYSTEMS LIBRARIES

3 4456 0274370 7

ORNL/TM-10639

ornl

OAK RIDGE
NATIONAL
LABORATORY

MARTIN MARIETTA

Stable Isotope Customer List and Summary of Shipments – FY 1987

J. G. Tracy

OAK RIDGE NATIONAL LABORATORY
CENTRAL RESEARCH LIBRARY
CIRCULATION SECTION
4500N ROOM 175
LIBRARY LOAN COPY
DO NOT TRANSFER TO ANOTHER PERSON
If you wish someone else to see this report, send in name with report and the library will arrange a loan.

OPERATED BY
MARTIN MARIETTA ENERGY SYSTEMS, INC.
FOR THE UNITED STATES
DEPARTMENT OF ENERGY

Printed in the United States of America. Available from
National Technical Information Service
U.S. Department of Commerce
5285 Port Royal Road, Springfield, Virginia 22161
NTIS price codes—Printed Copy: A03; Microfiche A01

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

ORNL/TM-10639

OPERATIONS DIVISION

STABLE ISOTOPE CUSTOMER LIST AND SUMMARY OF SHIPMENTS — FY 1987

Compiled by

J. G. Tracy

Date Published - March 1988

Prepared by the
OAK RIDGE NATIONAL LABORATORY
Oak Ridge, Tennessee 37831
operated by
MARTIN MARIETTA ENERGY SYSTEMS, INC.
for the
DEPARTMENT OF ENERGY
under Contract No. DE-AC05-84OR21400

MARTIN MARIETTA ENERGY SYSTEMS LIBRARIES

3 4456 0274370 7

CONTENTS

Page

INTRODUCTION 1

I. ALPHABETICAL LIST OF CUSTOMERS INCLUDING CONTACTS AND ISOTOPES PURCHASED..... 3

A. Domestic 3
B. Foreign 10

II. ALPHABETICAL LIST OF ISOTOPES CROSS-REFERENCED TO CUSTOMER NUMBERS..... 16

A. Domestic 16
B. Foreign 20

III. ALPHABETICAL LIST OF STATES AND COUNTRIES CROSS-REFERENCED TO CUSTOMER NUMBERS 24

A. Domestic 24
B. Foreign 24

IV. STABLE ISOTOPE SALES AND SERVICES - 1987 26

STABLE ISOTOPE CUSTOMER LIST AND SUMMARY OF SHIPMENTS — FY 1987

J. G. Tracy

INTRODUCTION

This compilation is published as an aid to those concerned with the separation and sale of stable isotopes. The information is divided into four sections as described below.

Section	Description
I.	Alphabetical lists of domestic and foreign customers, showing the stable isotopes and services purchased during the fiscal year. Isotopes are shown by isotope symbol. Services are shown by the abbreviations SS for special services and TGS for target preparation.
II.	Alphabetical lists of isotopes and services, cross-referenced to customer numbers and divided into domestic and foreign categories.
III.	Alphabetical lists of states and countries, cross-referenced to customer numbers and indicating geographical concentrations of isotope users.
IV.	Tabulation of the shipments, quantities, and dollars for each isotope and dollars for services divided into domestic, foreign, and DOE project categories.

During FY 1987 sales of stable isotope products and services were made to 272 different customers, of whom 159 were domestic and 113 were foreign, representing 18 different foreign countries. The total revenue was $3,785,609 of which 12.3% was from sales to DOE project customers, 60.4% was from sales to other domestic customers, and 27.3% was from sales to foreign customers. This represented sales of 189 different stable isotopes plus associated services and was a 16.5% increase over FY 1986.

Other reports in this series are:

ORNL/TM-1928	ORNL/TM-5089	ORNL/TM-8302
ORNL/TM-2038	ORNL/TM-5853	ORNL/TM-8704
ORNL/TM-2401	ORNL/TM-6241	ORNL/TM-8979
ORNL/TM-2747	ORNL/TM-6710	ORNL/TM-9430
ORNL/TM-3146	ORNL/TM-7214	ORNL/TM-9866/R1
ORNL/TM-3543	ORNL/TM-7764	ORNL/TM-10324
ORNL/TM-3987		

We wish to thank J. A. Delker and D. Mayes of the Business Systems Department of the ORGDP Computing Technology Center for their assistance in developing the tabulations.

I. ALPHABETICAL LIST OF CUSTOMERS, WITH CONTACTS AND ISOTOPES PURCHASED

A. DOMESTIC

1 Abilene Christian College
Box 8208
Abilene, Texas 79699

^{44}Ca, ^{63}Cu, ^{65}Cu, ^{54}Fe, ^{57}Fe, ^{24}Mg, ^{26}Mg, ^{92}Mo, ^{96}Mo, ^{58}Ni, ^{62}Ni, ^{116}Sn, SS, ^{64}Zn, ^{68}Zn, ^{90}Zr

2 Alabama, University of
Medical Center
1919 Seventh Avenue, South
Birmingham, Alabama 35486

^{43}Ca

3 Albert Einstein College of Medicine
1300 Morris Park Avenue
Bronx, New York 10461

^{119}Sn

4 Aldrich Chemical Company
Accounts Payable
P. O. Box 355
Milwaukee, Wisconsin 53201

^{7}Li, TGS

5 Amersham Corporation
Arlington Heights, Illinois 60005

^{57}Fe

6 Argonne National Laboratory
Attn: Chief Accountant - 201
9700 South Cass Avenue
Argonne, Illinois 60439

^{166}Er, ^{57}Fe, ^{73}Ge, ^{74}Ge, ^{76}Ge, ^{100}Mo, ^{60}Ni, ^{64}Ni, SS, TGS, ^{92}Zr, ^{94}Zr

7 Arizona State University
Accounts Payable
Tempe, Arizona 85287

^{136}Ba, SS, ^{172}Yb

8 Atlantic Richfield Hanford Company
P. O. Box 769
Richland, Washington 99352

^{6}Li

9 Atom Sciences, Incorporated
114 Ridgeway Center
Oak Ridge, Tennessee 37830

^{82}Se

10 Atomergic Chemetals Corporation
91 Carolyn Boulevard
Farmingdale, New York 11735-1527

^{34}S

11 Auburn University
Dept. of Chemical Engineering
230 Ross Hall
Auburn University, Alabama 36849-3501

^{56}Fe, ^{57}Fe, ^{116}Sn, SS

12 Auburn University
Nuclear Science Center
Auburn University, AL 36849

^{47}Ti

13 AT&T Bell Laboratories
P. O. Box 800
Short Hills, New Jersey 07078

^{111}Cd, ^{155}Gd, SS, TGS, ^{64}Zn, ^{66}Zn, ^{68}Zn

14 Ball Corporation/Efratom Division
3 Parker
Irvine, California 92718-1605

^{87}Rb

15 Battelle Northwest
P.O. Box 999
Richland, WA 99352

^{105}Pd, ^{108}Pd, ^{77}Se, ^{80}Se

16 Bicron Corporation
12345 Kinsman Road
Newbury, Ohio 44065

^{6}Li, SS

17 Boston University
School of Medicine
Accounting Department A-200
80 East Concord Street
Boston, Massachusetts 02118

^{6}Li, ^{7}Li

18 Brookhaven National Laboratory
Upton, Long Island, New York 11973

^{48}Ca, ^{69}Ga, ^{95}Mo, ^{58}Ni, ^{194}Pt, SS

19 Brown University
Providence, Rhode Island 02912

^{57}Fe

20 Cadema Medical Products, Incorporated
569 North Street
Middleton, New York 10940

^{120}Sn

21 California, University of
405 Hilgard Avenue
Los Angeles, California 90024

SS

22 California, University of
Santa Barbara, California 93106

^{179}Hf, ^{180}Hf, ^{6}Li

23 California, University of
Lawrence Livermore Laboratory
Box 808
Livermore, California 94550

^{6}Li, ^{7}Li, ^{25}Mg, ^{26}Mg, ^{146}Nd, ^{150}Nd, ^{58}Ni, ^{60}Ni, ^{192}Os, ^{195}Pt, ^{29}Si, ^{30}Si, ^{152}Sm, TGS

24 Carnegie Institution of Washington
Washington, D. C. 20008

^{178}Hf, ^{176}Lu

25 Carnegie-Mellon University
5000 Forbes
Pittsburgh, Pennsylvania 15213

^{54}Fe

26 Children's Hospital
Accounts Payable
300 Longwood Avenue
Boston, Massachusetts 02115

^{190}Os

27 Cintichem, Incorporated
Attn: Accounts Payable
P.O. Box 6950
Richmond, California 94806

^{50}Cr, ^{58}Fe, SS

28 Clark University
Worcester, Massachusetts 01610

SS

29 Cornell University
Purchasing
120 Maple Avenue
Ithica, New York 14850

^{167}Er, ^{151}Eu, ^{153}Gd, ^{178}Hf, ^{138}La, ^{6}Li, ^{176}Lu, ^{145}Nd, ^{208}Pb, ^{85}Rb, SS, ^{171}Yb, ^{91}Zr

30 CIBA-GEIGY Corporation
Accounts Payable Dept.
556 Morris Avenue
Summit, New Jersey 07901

^{77}Se

31 Denison University
Granville, Ohio 43023

SS

32 Department of Chemistry
Mount Holyoke College
South Hadley, Massachusetts 01075

TGS

33 Detroit, University of
4001 West McNichols Road
Detroit, Michigan 48221

^{63}Cu

34 Dow Chemical Company
P. O. Box 191
Midland, Michigan 48640

^{70}Ge, ^{104}Ru

35 Duke University
Disbursements-Accounting Operations
P.O. Box 40005
Durham, North Carolina 27706

^{37}Cl, ^{56}Fe, ^{28}Si, SS

36 E. I. Du Pont De Nemours & Company
NEN Products
Accounts Payable
549 Albany Street
Boston, Massachusetts 02118

^{44}Ca, ^{112}Cd, ^{50}Cr, ^{57}Fe, ^{41}K, ^{58}Ni, ^{102}Ru, ^{84}Sr, SS, ^{203}Tl, ^{184}W, ^{68}Zn, ^{94}Zr

37 Eastman Kodak Company
Kodak Park Division
Rochester, New York 14650

^{57}Fe, ^{61}Ni, ^{87}Sr, SS, ^{47}Ti

38 Esso Research and Engineering Company
P. O. Box 642
Linden, New Jersey 07036

^{57}Fe

39 EG&G
35 Congress Street
Salem, Massachusetts 01970-0662

^{85}Rb, ^{87}Rb

40 EG&G Idaho, Incorporated
Accounts Payable
P. O. Box 1625
Idaho Falls, Idaho 83415

^{176}Lu

41 ETA Industries, Inc.
35 East 21st Street
New York, NY 10010

^{87}Rb

42 Florida State University
Tallahassee, Florida 32306

^{6}Li, ^{168}Yb

43 Frequency Electronics, Incorporated
55 Charles Lindbergh Blvd.
Mitchel Field, New York 11553

^{87}Rb

44 General Electric Company
Development Center
P. O. Box 8
Schenectady, New York 12301

^{202}Hg, SS

45 Georgia, University of
Athens, Georgia 30601

^{57}Fe

46 Grumman Aerospace Corporation
Bethpage, L.I., New York 11714

TGS

47 Harvard University
Chemical Laboratories
12 Oxford Street
Cambridge, Massachusetts 02138

^{61}Ni

48 Hawaii, University of
Honolulu, Hawaii 96822

^{145}Nd, ^{87}Rb, ^{149}Sm

49 Imagents, Incorporated
P. O. Box 300486
Houston, Texas 77230-0486

^{58}Ni, ^{203}Tl

50 Indiana University
Accounts Payable
P. O. Box 4040
Bloomington, Indiana 47402

^{40}Ca, ^{44}Ca, ^{48}Ca, ^{208}Pb, TGS

51 Intelcom Rad Tech
P. O. Box 80817
San Diego, California 92138

^{6}Li

52 Iowa State University
Ames Laboratory
Purchasing Department
Room 139, Spedding Hall
Ames, Iowa 50011

TGS

53 Iowa State University
Purchasing Department
2nd Floor Physical Plant Building
Ames, Iowa 50011

^{64}Zn, ^{67}Zn, ^{70}Zn

54 Iowa, University of
Iowa City, Iowa 52240

^{58}Fe, ^{152}Gd, SS, ^{70}Zn

55 Isotec, Incorporated
3858 Benner Road
Miamisburg, Ohio 45342

^{6}Li, ^{7}Li

56 Isotope Products Laboratories
404 South Luke Street
Burbank, California 91502

^{122}Te, ^{168}Yb

57 IBM Corporation
P.O. Box 9452
New Haven, Connecticut 06534-0452

^{57}Fe

58 ICN Biomedicals, Incorporated
P. O. Box 19536
Irvine, California 92714
Attn: Accounts Payable

^{44}Ca, ^{116}Cd, ^{53}Cr, ^{6}Li, ^{7}Li, ^{74}Se,
^{64}Zn, ^{68}Zn

59 John Hopkins University
Accounts Payable Department
Charles & 34th Street
Baltimore, Maryland 21218

^{63}Cu, ^{65}Cu, ^{56}Fe, ^{57}Fe

60 Kent State University
Accounts Payable
Kent, Ohio 44242

^{156}Gd, TGS

61 Lockheed Engineering & Mgmt. Services C
1830 Nasa Road 1
Houston, Texas 77258

^{48}Ca, ^{40}K

62 Mallinckrodt, Inc.
2703 Wagner Place
Maryland Heights, Missouri 63043

^{112}Cd

63 Maryland, University of
College Park, Maryland 20742

^{40}Ca, ^{48}Ca, ^{6}Li, ^{32}S, ^{34}S, TGS, ^{66}Zn,
^{70}Zn

64 Massachusetts General Hospital
Isotope Laboratory
Boston, Massachusetts 02114

^{6}Li

65 Massachusetts Institute of Technology
Box 69
Cambridge, Massachusetts 02139

^{57}Fe, ^{61}Ni, ^{190}Os, ^{46}Ti, ^{91}Zr

66 Mayo Foundation
200 1st Street SW
Box 10,000
Rochester, Minnesota 55905

^{42}Ca, ^{43}Ca, ^{44}Ca

67 Medi-Physics, Incorporated
Accounts Payable
P.O. Box 289
Paramus, New Jersey 07653-0289

^{124}Te, ^{68}Zn

68 Michigan State University
Attn: Accounts Payable
366 Administration Building
East Lansing, Michigan 48824

^{6}Li

69 Michigan State University
NSCL Cyclotron Laboratory
South Shaw Lane
East Lansing, Michigan 48824-1321

^{42}Ca

70 Microfoils
P. O. Box 283
Argonne, Illinois 60439

^{56}Fe, ^{57}Fe, ^{100}Mo, ^{60}Ni, ^{64}Ni, ^{118}Sn,
SS

71 Micromatter Company
123 Madrona Lane
P. O. Box 123
Deer Harbor, Washington 98243

^{107}Ag, ^{70}Ge, ^{72}Ge, ^{73}Ge, ^{208}Pb, ^{76}Se, ^{82}Se, ^{117}Sn, ^{119}Sn

72 Mississippi, University of
University, Mississippi 38677

^{44}Ca, ^{48}Ca, ^{64}Ni, SS

73 Morton Thiokol, Incorporated
Wasatch Operations
P.O. Box 524
Brigham City, Utah 84302

^{6}Li

74 National Bureau of Standards
Accounting Division
Gaithersburg, Maryland 20899

^{42}Ca, ^{37}Cl, ^{73}Ge, ^{6}Li, ^{58}Ni, ^{82}Se, ^{117}Sn

75 National Institutes of Health
Accounts Payable Section, DFM
Building 31, Room B1B39
Bethesda, Maryland 20892

^{42}Ca, ^{44}Ca, ^{46}Ca, ^{68}Zn

76 Neorx Corporation
410 West Harrison Road
Seattle, Washington 98119

SS, ^{186}W

77 New York Psychiatric Institute
722 West 168th Street
New York, New York 10032

^{6}Li, ^{7}Li

78 New York, State University of
Research Foundation
Stony Brook, New York 11790

^{114}Cd, ^{63}Cu, ^{100}Mo, ^{208}Pb, ^{126}Te

79 Northern Illinois University
Box 185
DeKalb, Illinois 60115

^{57}Fe

80 Northwestern University
Physics & Astronomy Department
2145 Sheridan Road
Evanston, Illinois 60201

^{6}Li, ^{104}Pd, ^{106}Pd, ^{108}Pd, ^{110}Pd, SS

81 Notre Dame, University of
Notre Dame, Indiana 46556

^{110}Pd, ^{28}Si

82 Oak Ridge National Laboratory
P.O. Box X
Oak Ridge, Tennessee 37831

^{114}Cd, ^{54}Fe, ^{73}Ge, ^{74}Ge, ^{191}Ir, ^{6}Li, ^{7}Li, ^{24}Mg, ^{96}Mo, ^{100}Mo, ^{144}Nd, ^{146}Nd, ^{58}Ni, ^{60}Ni, ^{64}Ni, ^{110}Pd, ^{195}Pt, ^{76}Se, ^{144}Sm, ^{147}Sm, ^{112}Sn, ^{118}Sn, ^{84}Sr, SS, ^{122}Te, ^{123}Te, ^{124}Te, ^{126}Te, TGS, ^{46}Ti,

82 Oak Ridge National Laboratory
P.O. Box X
Oak Ridge, Tennessee 37831

^{50}Ti, ^{186}W, ^{168}Yb

83 Ohio University
Accounts Payable
Scott Quad
Athens, Ohio 45701

SS

84 Oklahoma, University of
Norman, Oklahoma 73069

^{6}Li

85 Opthos Instruments, Inc.
17805 Caddy Drive
Rockville, Maryland 20855

^{114}Cd

86 Oregon State University
Corvallis, Oregon 97330

^{124}Te

87 Oregon, University of
Eugene, Oregon 97403

^{7}Li

88 Pennsylvania State University
University Park, Pennsylvania 16802

^{6}Li

89 Pennsylvania State University
Applied Research Laboratory
P.O. Box 30
North Atherton Street
State College, Pennsylvania 16804

^{7}Li, TGS

90 Phillips Petroleum Company
Bartlesville, Oklahoma 74003

^{153}Eu, ^{202}Hg, ^{6}Li, ^{207}Pb, ^{77}Se, ^{144}Sm, ^{84}Sr

91 Princeton University
James Forrestal Campus
Princeton, New Jersey 08540

^{166}Er, ^{167}Er, ^{24}Mg, ^{85}Rb, ^{87}Rb, ^{128}Te, ^{130}Te, TGS

92 Proctor and Gamble Company
Post Office Box 175
Groesbeck Station
Cincinnati, Ohio 45239

^{42}Ca, ^{44}Ca

93 Purdue University
Purchasing Department
Accounts Payable
Freehafer Hall
West Lafayette, Indiana 47907

^{42}Ca, ^{44}Ca, ^{61}Ni, ^{122}Te

94 Rensselaer Polytechnic Institute
110 8th Street
Troy, New York 12181

^{30}Si

95 Rochester, University of
575 Elmwood Avenue
Rochester, New York 14627

^{114}Cd, ^{76}Se, ^{82}Se

96 Rutgers-The State University
Disbursement Process Control
P. O. Box 1089
Piscataway, New Jersey 08854

^{111}Cd, ^{113}Cd, ^{87}Rb, ^{187}Re, ^{119}Sn, ^{122}Sn, ^{84}Sr, SS, ^{123}Te, ^{125}Te

97 Sandia Corporation
Post Office Box 5800
Albuquerque, New Mexico 87115

^{63}Cu, ^{65}Cu, ^{200}Hg, ^{204}Hg

98 Signal Research Center Inc.
P.O. Box 5016
Des Plaines, IL 60017

^{195}Pt, ^{194}Pt

99 Solar Energy Research
1536 Cole Boulevard
Golden, Colorado 80401

^{65}Cu

100 Stanford Linear Accelerator Center
P. O. Box 4349
Stanford, California

SS

101 Stanford University
P. O. Box 4409
Stanford, California 94305

^{29}Si

102 State University of New York at Buffalo
Accounts Payable
George D. Crofts Hall
Buffalo, New York 14260

^{58}Fe, ^{193}Ir, ^{192}Os

103 Teledyne Wah Chang Albany
Division of Teledyne Ind. Inc.
P. O. Box 460
Albany, Oregon 97321

^{177}Hf, ^{180}Hf, ^{90}Zr, ^{94}Zr

104 Temple University
Broad and Montgomery Streets
Philadelphia, Pennsylvania 19140

SS

105 Tennessee, University of
Knoxville, Tennessee 37916

^{208}Pb, SS

106 Texas at Dallas, University of
P. O. Box 30365
Dallas, Texas 75230

^{42}Ca

107 Texas A and M University
Post Office Box 44
College Station, Texas 77843

^{208}Pb

108 Texas Instruments Incorporated
Equipment Group
P.O. Box 660425 M/S3136
Dallas, Texas 75266
Attn: Accounts Payable

^{198}Pt

109 Texas, University of
Austin, Texas 78712

^{37}Cl, ^{179}Hf, ^{147}Sm

110 Theragenics Corporation
900 Atlantic Drive
Atlanta, GA 30332

^{6}Li

111 U. S. Navy
Naval Ocean Systems Center
Accounting Branch Code 122
271 Catalina Boulevard
San Diego, California 92152-5122

^{198}Hg, ^{200}Hg, ^{204}Hg

112 U.S. Services Incorporated
19 Ox Bow Lane
Summit, New Jersey 97901

^{135}Ba, ^{111}Cd, ^{113}Cd, ^{65}Cu, ^{170}Er, ^{87}Sr

113 Union College
Schenectady, New York 12308

^{42}Ca, ^{43}Ca, ^{44}Ca, ^{48}Ca

114 United States Department of Agriculture
Research Service
P. O. Box 53326
New Orleans, Louisiana 70150

^{44}Ca, ^{53}Cr, ^{54}Fe, ^{56}Fe, ^{58}Fe, SS, ^{67}Zn

115 United States Department of Interior
Geology Survey
Bldg. 21, Denver Federal Center
Denver, Colorado 80225

^{114}Cd, ^{65}Cu, ^{26}Mg, ^{84}Sr, ^{203}Tl, ^{68}Zn

116 United States Geological Survey
Financial Management
National Center, Room 1447-A
12201 Sunrise Valley Drive
Reston, Virginia 22092

^{54}Fe, ^{41}K, ^{206}Pb, ^{208}Pb

117 Universal Energy Systems, Incorporated
Attn: Accounts Payable
4401 Dayton Xenia Road
Dayton, Ohio 45432

^{30}Si

118 University of Arizona
Attention: Accounts Payable
Post Office Box 41030
Tucson, Arizona 85717-1030

^{158}Gd, ^{207}Pb, ^{208}Pb, ^{77}Se

119 University of Arizona
Department of Chemistry
Tucson, Arizona 85721

^{33}S, ^{77}Se, SS

120 University of California
P. O. Box CA
Irvine, California 92716

^{6}Li, SS

121 University of California
Lawrence Berkeley Laboratory
P.O. Box 528
Berkeley, California 94550

^{135}Ba, ^{138}Ba, ^{44}Ca, ^{63}Cu, ^{65}Cu, ^{74}Ge, ^{76}Ge, ^{150}Nd, ^{104}Ru, ^{82}Se, ^{88}Sr, SS, ^{122}Te, TGS, ^{70}Zn

122 University of California
Los Alamos National Laboratory
Accounting Dept.
P. O. Box 1663
Los Alamos, New Mexico 87545

^{135}Ba, ^{138}Ba, ^{48}Ca, ^{111}Cd, ^{140}Ce, ^{142}Ce, ^{53}Cr, ^{65}Cu, ^{163}Dy, ^{167}Er, ^{54}Fe, ^{57}Fe, ^{155}Gd, ^{160}Gd, ^{73}Ge, ^{177}Hf, ^{198}Hg, ^{200}Hg, ^{191}Ir, ^{193}Ir, ^{6}Li, ^{7}Li, ^{26}Mg, ^{100}Mo, ^{145}Nd, ^{62}Ni, ^{186}Os, ^{204}Pb, ^{208}Pb, ^{105}Pd, ^{110}Pd, ^{198}Pt, ^{85}Rb, ^{99}Ru, ^{33}S, ^{77}Se, ^{30}Si, ^{147}Sm, ^{118}Sn, ^{119}Sn, SS, ^{125}Te, TGS, ^{46}Ti, ^{203}Tl, ^{182}W, ^{183}W, ^{184}W, ^{186}W, ^{170}Yb, ^{171}Yb, ^{67}Zn, ^{91}Zr

123 University of California San Diego
Accounting Office (Q-027)
La Jolla, California 92093

^{57}Fe, ^{146}Nd, ^{150}Sm

124 University of Chicago
Account Payable
1525 E. Hyde Park Boulevard
Chicago, Illinois 60615

^{160}Gd, ^{199}Hg, ^{146}Nd, ^{152}Sm, SS

125 University of Cincinnati
Purchasing Department
Cincinnati, Ohio 45221

^{57}Fe, ^{150}Sm, ^{116}Sn, SS, TGS, ^{186}W, ^{170}Yb

126 University of Colorado
Accounts Payable
Campus Box 54
Boulder, Colorado 80309

^{87}Rb, ^{147}Sm

127 University of Colorado
Health Sciences Center
Accounts Payable A063
4200 E. Ninth Avenue
Denver, Colorado 80262

^{70}Zn

128 University of Connecticut
Health Center
Accounts Payable, Bldg. #18
Farmington, Connecticut 06032

^{44}Ca

129 University of Florida
Department of Chemistry
Room 318, Leigh Hall
Gainesville, Florida 32611

^{63}Cu, TGS

130 University of Florida
Advanced Materials Research Center
One Progress Boulevard, Box 11
Alachua, Florida 32615

^{7}Li

131 University of Florida
Physics Department
224A Williamson Hall
Gainesville, Florida 32611

SS

132 University of Illinois
252 Administration Building
Accounting Division
506 South Wright Street
Urbana, Illinois 61801

^{114}Cd, ^{57}Fe, ^{6}Li, SS

133 University of Kentucky
Chemistry Department
Room 120 Chemistry-Physics Building
Lexington, Kentucky 40506-0055

^{204}Hg, SS

134 University of Kentucky
Physics & Astronomy
74 Chemistry-Physics Building
Lexington, Kentucky 40506

^{116}Sn, SS

135 University of Kentucky
College of Pharmacy
907-909 Rose Street
Lexington, Kentucky 40536-0082

^{44}Ca

136 University of Maryland at Baltimore
Accounts Payable - Schools
737 W. Lombard Street
Baltimore, Maryland 21201

^{26}Mg

137 University of Massachusetts
Department of Chemistry
Amherst, Massachusetts 01003

^{206}Pb, SS, ^{92}Zr

138 University of Massachusetts
Department of Physics & Astronomy
Amherst, Massachusetts 01003

^{117}Sn, SS, TGS

139 University of Michigan
Accounts Payable
3036 Administrative Services Building
Ann Arbor, Michigan 48109

^{54}Fe, TGS

140 University of Minnesota
Business Office
1919 University Avenue
St. Paul, Minnesota 55104

^{44}Ca, ^{113}Cd, ^{57}Fe, ^{67}Zn

141 University of Missouri
Purchasing Department
General Services Building
Columbia, Missouri 65211

^{65}Cu, ^{158}Dy, ^{58}Fe, SS, ^{186}W, ^{168}Yb, ^{70}Zn

142 University of Pennsylvania
Accounts Payable Department
3451 Walnut Street, Room 215
Philadelphia, Pennsylvania 19104-6281

^{40}Ca, ^{104}Cd, ^{108}Cd, ^{110}Cd, ^{58}Fe, SS, ^{50}Ti

143 University of Rhode Island
Graduate School of Oceanography
South Ferry Road
Narragansett, Rhode Island 02882

^{150}Nd, ^{147}Sm

144 University of South Carolina
Attn: Accounts Payable Department
516 S. Main Street
Columbia, South Carolina 29208

^{87}Rb, SS

145 University of Southern California
Accounts Payable
P. O. Box 77967
Los Angeles, California 90089-1141

^{194}Pt

146 University of Texas at Dallas
Attention: Accounts Payable
Post Office Box 830688
Richardson, Texas 75083-0688

^{138}La, ^{145}Nd, ^{150}Nd, ^{149}Sm, ^{150}Sm, ^{119}Sn, SS

147 V. A. Hospital
Allen Park, Michigan
Calm-VA-3 (553)
PO Box 2973
Austin, TX 78769

^{70}Zn

148 V. A. Medical Center, Denver
CALM-VA-3-554
P. O. Box 2973
Austin, Texas 78769

^{6}Li

149 Virginia, University of
Charlottesville, Virginia 22903

^{44}Ca, ^{48}Ca, ^{30}Si, SS, TGS

150 Washington, University of
400 Administration Building
Seattle, Washington 98105

^{111}Cd, ^{198}Hg, ^{199}Hg, ^{200}Hg, ^{201}Hg, ^{204}Hg, ^{58}Ni, ^{208}Pb, TGS

151 West Valley Nuclear Services Co., Inc.
Attention: Accounts Payable
Post Office Box 191
West Valley, New York 14171-0191

^{85}Rb, ^{87}Rb, ^{144}Sm, ^{84}Sr

152 Westinghouse Electric Corporation
Bettis Atomic Power Laboratory
Post Office Box 79
West Mifflin, Pennsylvinia 15122

SS

153 Westinghouse Hanford Company
P. O. Box 1970
Richland, Washington 99352

^{54}Fe, ^{154}Gd, ^{7}Li, ^{93}Mo, ^{98}Mo, ^{144}Nd, ^{62}Ni, SS, ^{203}Tl

154 Wisconsin, University of
750 University Avenue
Madison, Wisconsin 53706

^{57}Fe, ^{6}Li, ^{61}Ni

155 Wisconsin, University of, Milwaukee
2150 North Prospect Avenue
Milwaukee, Wisconsin 53202

^{77}Se

156 Woods Hole Oceanographic Institute
Woods Hole, Massachusetts 02543

^{208}Pb

157 Y-12, Martin Marietta Energy Systems, I
P.O. Box Y
Oak Ridge, Tennessee 37831

^{140}Ce, ^{6}Li, SS, ^{203}Tl

158 Yale University
20 Ashmun Street
New Haven, Connecticut 06520

^{98}Mo

159 Yeshiva University
1300 Morris Park Avenue
Bronx, New York 10461

SS

B. FOREIGN

AUSTRALIA

160 Australian Mineral Dev. Labs.
C/O The Accountant
P.O. Box 114
Eastwood, South Australia 5063
Australia

^{41}K

161 Australian National University
Research School of Physical Sciences
Supply Office, G.P.O. Box 4
Canberra, A.C.T. 2601
Australia

^{192}Os, ^{196}Pt, ^{88}Sr, ^{130}Te

162 Australian Nuclear Science & Technology
Australian Radioisotopes
Building 238, New Illawarra Road
Lucas Heights NSW 2234
Australia

^{42}Ca, ^{44}Ca, ^{35}Cl, ^{37}Cl, ^{57}Fe, ^{6}Li,
^{204}Pb, ^{152}Sm, TGS

163 Monash University
The Accountant
Wellington Road
Clayton, Victoria
Australia, 3168

^{57}Fe

164 University of Melbourne
School of Physics
Parkville, Victoria, 3052
Australia

^{50}Cr, ^{54}Fe, ^{194}Pt, ^{48}Ti

165 University of Queensland
Department of Chemistry
St. Lucia 4067
QLD, Australia

^{63}Cu, ^{57}Fe

BELGIUM

166 Institut National des Radioelements
Service des Achats
Zoning Industrieldu Wainage
B - 6200 Fleurus
Belgium

^{44}Ca

167 Joint Research Centre
Central Bureau for Nuclear Measurements
Steenweg op Retie
2400 Geel
Belgium

^{57}Fe, ^{149}Sm, SS

168 S.C.K. - C.E.N.
Rue Ch. Lemaire 1
1160 Brussels
Belgium

^{158}Gd

169 University de Liege
Centre De Recherche Du Cyclotron
B-4000 Liege
Belgium

^{74}Se

CANADA

170 Animal Research Centre
Agriculture Canada Research Branch
Finance & Material Managemont Unit
Central Experimental Farm, Bldg. 60
Ottawa, Ontario K1A 0C6
Canada

^{63}Cu

171 Atomic Energy of Canada Limited
Radiochemical Co.
P. O. Box 13500
Kanata, Ontario K2K 1X8
Canada

^{50}Cr, ^{58}Ni, SS

172 Atomic Energy of Canada Limited
Chalk River, Ontario, Canada

^{107}Ag, ^{192}Os, ^{204}Pb, ^{198}Pt, ^{82}Se,
^{117}Sn, SS, ^{90}Zr, ^{92}Zr, ^{94}Zr

173 McMaster University
Hamilton, Ontario, Canada

^{43}Ca, ^{44}Ca, ^{48}Ca, ^{136}Ce, ^{160}Gd, ^{191}Ir,
^{138}La, ^{190}Os, ^{208}Pb, ^{105}Pd, ^{108}Pd,
^{194}Pt, ^{99}Ru, ^{117}Sn, ^{119}Sn

174 Memorial University of Newfoundland
St. John's Newfoundland
Canada A1C557

^{136}Ce, ^{166}Er, ^{145}Nd, ^{171}Yb, ^{91}Zr

175 Merck Frosst Canada, Incorporated
P. O. Box 1005
Pointe Claire - Dorval Quebec
Canada H9R 4P8

^{113}Cd, ^{102}Ru, ^{104}Ru, ^{33}S

176 S.Y.E.P. #1002 xx4
c/o P. O. Box 1000
Agassiz, British Columbia V0M 1A0
Canada

^{82}Se

177 Saint Francis Xavier University
Attn: Accounts Payable Office
Antigonish, Nova Scotia
Canada, B2G 1C0

^{87}Rb, ^{84}Sr

178 Scintrex, Ltd.
222 Snidercroft Road
Concord, Ontario, Canada

^{39}K

179 TRIUMF
4004 Wesbrook Mall
Vancouver, British Columbia
Canada V6T 2A3

^{70}Ge, ^{72}Ge, SS, TGS, ^{184}W

180 University of Alberta
Edmonton, Alberta, Canada T6G2H1

SS

181 University of Saskatchewan
Accounts Payable Department
Administration Building
Saskatoon, Saskatchewan
Canada S7N 0W0

^{142}Ce, ^{167}Er, ^{155}Gd, ^{138}La, ^{176}Lu, ^{150}Nd, SS, ^{171}Yb

182 Western Ontario, University of
Accounts Payable
Stevenson Lawson Bldg. Rm. 280
London, Ontario, Canada N6A 5B8

SS, TGS, ^{48}Ti

CHINA

183 Academia Sinica
Institute of Earth Sciences
P.O. Box 23-59
Taipei, Taiwan 107
Republic of China

^{135}Ba, ^{163}Dy, ^{157}Gd, ^{40}K, ^{176}Lu, ^{85}Rb, ^{84}Sr, SS, ^{171}Yb, ^{91}Zr

184 China Business Enterprises, Incorporate
109 East 15th Street
New York, New York 10003

^{176}Lu, ^{204}Pb

185 Precision Instrument Development Center
P.O. Box 2-2
Hsinchu, Taiwan
REPUBLIC OF CHINA

^{147}Sm

DENMARK

186 Geologisk Centralinstitut
University of Copenhagen
Oster Voldgade 10
DK-1350 Copenhagen K
Denmark

^{84}Sr

187 Kobenhauns Universitet
Niels Bohr Institutet
Tandem Accelerator Laboratory
Riso, 4000 Roskilde
Denmark

^{142}Nd, SS

188 Kobenhavns Universitet
Niels Bohr Institutet
Kemi-Afdelingen
Blegdamsvej 17, 2100 Kobenhavn 0
Denmark

^{108}Pd, ^{122}Te, ^{126}Te

189 Riso National Laboratory
DK-4000 Roskilde
Denmark

^{44}Ca

ENGLAND

190 Agricultural & Food Research Council
Food Research Institute
Colney Lane
Norwich, NR4 7UA
England

^{42}Ca, ^{44}Ca

191 Amersham International Limited
White Lion Road Amersham
Buckinghamshire England HP7 9LL

^{44}Ca, ^{140}Ce, ^{84}Sr, SS

192 Birmingham, University of
Edgbaston, Birmingham 15, England

^{106}Cd, ^{54}Fe, SS

193 British Embassy
UKDPO Finance, G2260, Rm. 289
3100 Massachusetts Avenue, N.W.
Washington, D.C. 20008

^{168}Er, ^{54}Fe, ^{74}Ge, ^{74}Se, ^{148}Sm, SS, ^{47}Ti, ^{182}W, ^{184}W, ^{186}W

194 Cambridge University
Cambridge, England

^{84}Sr

195 Leeds, University of
Leeds 2, England

^{117}Sn, ^{124}Sn

196 Levy Hill Laboratories Limited
5 Sheffield House
Fieldings Road
Cheshunt, Herts EN8 9TJ
England

^{6}Li

197 Liverpool, University of
Liverpool 3, England

^{50}Cr, ^{52}Cr, ^{54}Cr, ^{166}Er, ^{54}Fe, ^{56}Fe, ^{156}Gd, ^{74}Ge, ^{146}Nd, ^{62}Ni, ^{147}Sm, ^{148}Sm, ^{149}Sm, ^{150}Sm, ^{152}Sm, ^{118}Sn, ^{46}Ti, ^{176}Yb, ^{64}Zn, ^{66}Zn

198 Manchester University
Manchester 13, England

^{167}Er, ^{179}Hf, ^{194}Pt, ^{122}Sn, SS, ^{124}Te

199 Oxford, University of
Nuclear Physics Laboratory
21 Banbury Road
Oxford, England

^{168}Yb

200 Panalpina, Incorporated
UKDPO Representative
1389 2-13894 Redskin Drive
Herndon, Virginia 22071

^{44}Ca, ^{37}Cl, ^{41}K, ^{6}Li, ^{146}Nd

201 Sussex, University of
Brighton, Sussex, England

^{6}Li

202 University of York
Department of Physics
Heslington, York YO1 5DD
England

^{70}Ge, ^{104}Pd, ^{105}Pd, ^{104}Ru

203 Vinten Ivstruments Limited
Jessamy Road
Weybridge, Surrey KT13 8LE
England

^{6}Li

FRANCE

204 Commissariat A L'Energie Atomique
Office Des Rayonnements Ionisants
Purchasing Department
B.P. 21
91190 Gif-Sur-Yvette, France

^{139}La

205 Institut Max von Laue-Paul Langevin
Cedex 156
38 Grenoble-Gare, France

^{187}Os

206 Laboratoire Associe No. 10
C.N.R.S.
S. Rue Kessler
62038 Clermont-Ferrand, Cedex
France

^{146}Nd

207 Laboratoire De Chimie Nucleaire
B.P. 20
67037 Strasbourg Cedex
France

^{74}Ge, ^{32}S, SS

208 Societe National des Petroles d'Aquitai
26 Avenue des Lilas
64 Pau, France

^{150}Nd

209 Universite De Bretagne Occidentale
Service Financier-Rue Des Archives
B.P. 137
29269 Brest Cedex
France

^{29}Si, ^{30}Si

GERMANY

210 Alfred Hempel GMBH & Company, KG
Cecilienallee 36
D-4000 Duesseldorf 30
West Germany

^{112}Sn, SS

211 Amersham Buchler Gmbh & Company KG
1 Gieselweg
3300 Braunschweig
West Germany

TGS, ^{173}Yb

212 Bochum, Ruar-Universitat
463 Bochum, West Germany

^{6}Li

213 Bundesenstact, Physikalish-Technische
Bundesallee 100
Braunschweig, Germany

^{6}Li

214 Darmstadt, Technischen Hochschule
61 Darmstadt, Germany

^{174}Hf, SS, TGS

215 Der Universitat Gottingen
Zweites Physikalisches Institut
Bunsenstrabe 7-9
D-3400 Gottingen
Germany

SS

216 Erlangen-Nurnberg, University
Gluckstr.
852 Erlangen, West Germany

^{50}Cr

217 Fachbereich Physik
der TU-Munchen
Strahlenschutzabt. Z 62
James-Franck-Weg
D-8046 Garching B. Munchen, West German

^{204}Pb, ^{207}Pb, ^{208}Pb, SS

218 Federal Instrtute for Geosciences & Nat
Stilleweg 2
D-3000 Hannover 51
West Germany

^{84}Sr

219 Freiburg/Brsg., Universitat
7800 Freiburg/Brsg., Germany

^{57}Fe

220 Freie Universitat Berlin
SFB-161
Arnimallee 14
1 Berlin 33,
W. Germany

^{109}Ag, ^{70}Ge, ^{74}Ge, ^{130}Te

221 Gesellschaft fur Schwerionenforschung,
Planckstr. 1
D-6100 Darmstadt 11
Federal Republic of Germany
Germany

^{50}Cr, ^{98}Mo, ^{100}Mo, ^{64}Ni, ^{110}Pd, ^{99}Ru,
SS, ^{96}Zr

222 Gesellschaft Fur Strahlen-
U. Umweltforschung Munchen
Post Oberschleibheim
Ingolstadter Landster 1
D-8042 Neuherberg, FRG, West Germany

^{43}Ca, ^{44}Ca

223 Hahn-Meitner-Institut
fur Kernforschung Berlin, Sekton Kernph
Berlin, Germany

^{192}Pt

224 Heidelberg, Universitat
Heidelberg, Germany

^{6}Li, ^{98}Mo

225 Institut fur Strahlenphysik
der Universitat Stuttgart
Allmandring 3
D-7000 Stuttgart 80,
West Germany

^{146}Nd

226 Johann Wolfgang Goethe University
Frankfurt/Main, Germany

^{111}Cd, ^{113}Cd, TGS

227 Kernforschungsanlage Julich GmbH
Postfach 1913
D-517 Julich, FRG
West Germany

^{92}Mo, ^{123}Te, ^{124}Te

228 Kernforschungszentrum Karlsruhe
Postfach 3640
7500 Karlsruhe
West Germany

^{48}Ca, ^{58}Ni, ^{60}Ni, ^{62}Ni, ^{208}Pb, ^{33}S,
^{116}Sn, ^{118}Sn, ^{120}Sn, ^{124}Sn, SS, TGS

229 Koln, Universitat
Zulpicher Str. 47
5 Koln 1, Germany

^{40}Ca, ^{50}Cr, ^{98}Mo, ^{187}Os

230 Max Planck Institut fur Kernphysik
Saupfercheckweg
Heidelberg, Germany

^{58}Ni, ^{60}Ni, ^{104}Ru, TGS, ^{48}Ti, ^{96}Zr

231 Max Planck Institute fur Chemie
Saarstrasse 23, Mainz
West Germany

^{149}Sm, SS

232 Max-Planck Institut
Bottingerstrasse 6/8,
D34 Gottingen, West Germany

^{6}Li

233 Phillipps Universitat, F. B. 14
Attn: Dr. Reinhard Brandt
Kern Chemie
355 Marburg, Lahnberg, West Germany

^{6}Li

234 Tubingen University
West Germany

^{204}Hg, ^{82}Se

235 Universitat zu Koln
II. Physikalisches Institut
Zulpicher Str. 77N
D-5000 Koln
West Germany

^{155}Gd, ^{157}Gd, ^{104}Pd, ^{198}Pt, ^{196}Pt,
^{124}Te, TGS, ^{173}Yb

236 Universitat Bielefeld
Fakultat fur Physik
Universitatsstrasse
4800 Bielefeld 1
West Germany

^{35}Cl, ^{37}Cl, ^{6}Li

237 Universitat Wuppertal
FB 9 - Anorg. Chemie
Gaupstr. 20
D-5600 Wuppertal
West Germany

^{80}Se, SS, ^{130}Te

238 University of Bonn
Institut fur Strahlen-und-Kernphysik
Nussallee 14-16
D5300 Bonn
West Germany

^{110}Pd, TGS, ^{96}Zr

239 University of Kiel
Institute of Inorganic Chemistry
23 Kiel, Germany
West Germany

^{187}Os, ^{99}Ru, ^{104}Ru

240 University of Siegen
Dezernat 1'
P.O. Box 21 0209
5900 Siegen 21
West Germany

^{6}Li

ISRAEL

241 Tel-Aviv University
Ramat-Avit
Tel-Aviv, Israel

^{57}Fe, ^{119}Sn

ITALY

242 C.N.R.
Istituto Teoria e Struttura
Via Salaria Km. 29.500 - C.P. 10
00016 Monterotondo Stazione
(Roma) Italy

^{63}Cu, ^{98}Mo

243 Consiglio Nazionale Delle Ricerche
Centro Studi Orogeno Alpi Orientali
Corso Garibaldi 37
35100 Padova, Italy

^{84}Sr

244 Consiglio Nazionale Delle Ricerche
Instituto Di Geocronologia
Via C. Maffi 36
56100 Pisa

^{167}Er, ^{155}Gd, ^{139}La, ^{207}Pb, ^{84}Sr, ^{171}Yb

245 Instituto Nazionale Di Fisica Nucleare
Laboratori Nazionali Di Legnaro
Via Romea n. 4 - 35030 Legnaro
Padova Italy

^{44}Ca, ^{58}Ni, SS

246 Universita Degli Studi di Modena
Dipartimento di Chimica
Via Campi, 183
41100 Modena
Italy

^{113}Cd

JAPAN

247 Daiichi Radioisotope Laboratories, Ltd.
10-5, Nihonbashi 3-Chome, Chuo-Ku
Tokyo 103 Japan

^{203}Tl, ^{68}Zn

248 Japan Atomic Energy Research Institute
2-2, Uchisaiwai-Cho 2-Chome
Chiyoda, Tokyo 100
Japan

^{52}Cr, SS, TGS

249 Japan Radioisotope Association
Hon-Komagome 2 Chome 28
Bunkyo-Ku
Tokyo, Japan

^{79}Br, ^{81}Br, ^{40}Ca, ^{42}Ca, ^{44}Ca, ^{48}Ca, ^{116}Cd, ^{140}Ce, ^{35}Cl, ^{50}Cr, ^{53}Cr, ^{63}Cu, ^{65}Cu, ^{160}Dy, ^{54}Fe, ^{57}Fe, ^{155}Gd, ^{70}Ge, ^{72}Ge, ^{74}Ge, ^{76}Ge, ^{174}Hf, ^{204}Hg, ^{39}K, ^{40}K, ^{6}Li, ^{7}Li, ^{176}Lu, ^{24}Mg, ^{25}Mg, ^{26}Mg, ^{92}Mo, ^{94}Mo, ^{100}Mo, ^{58}Ni, ^{62}Ni, ^{64}Ni, ^{184}Os, ^{186}Os, ^{190}Os, ^{206}Pb, ^{207}Pb, ^{208}Pb, ^{190}Pt, ^{192}Pt, ^{194}Pt, ^{85}Rb, ^{87}Rb, ^{99}Ru, ^{74}Se, ^{28}Si, ^{152}Sm, ^{116}Sn, ^{86}Sr, SS, ^{123}Te, ^{124}Te, ^{128}Te, TGS, ^{46}Ti, ^{47}Ti, ^{48}Ti, ^{50}Ti, ^{176}Yb, ^{64}Zn, ^{66}Zn, ^{67}Zn, ^{68}Zn

250 Kansai Electronics Co., Ltd.
8 Toganocho
Kitaku, Osaka, Japan

^{57}Fe, ^{69}Ga, ^{24}Mg, ^{85}Rb, ^{150}Sm, TGS

251 Nagasaki University
Department of Industrial Chemistry
Faculty of Engineering
Nagasaki 852
Japan

^{113}Cd

252 New Metals & Chemicals Corp., Ltd.
Shin Dai-Ichi Building 4-13
3 Chome, Nihonbashi
Chuo-Ku, Tokyo, Japan

^{114}Cd, ^{6}Li, SS

KOREA

253 Korea Institue of Energy & Resources
219-5, Garibong-Dong, Guro-Gu
Seoul, Korea 150-06

^{84}Sr

254 Modu Corporation
33-10 Queens Boulevard
Long Island City, New York 11101
Korea

^{44}Ca, ^{50}Cr, ^{58}Ni

255 Yonzei University
Department of Physics
Seoul, KOREA 120-00

^{57}Fe

NETHERLANDS

256 Kernfysisch Versneller Instituut
Stichting Fom
Zernikelaan 25
NL 9747 AA Groningen
Netherlands

^{6}Li

257 Koninklijke/Shell-Laboratorium
P. O. Box 3003
1003 Aa Amsterdam
Netherlands

^{110}Cd, ^{207}Pb, ^{198}Pt

258 Netherlands Energy Research Foundation
P. O. Box 80404
2508 GH The Hague
Netherlands

^{43}Ca, ^{44}Ca, ^{25}Mg, ^{84}Sr

259 Rijksuniversiteit Utrecht
Fysisch Laboratorium
Princetonplein 5
Postbus 80.000
3508 TA Utrecht, The Netherlands

^{6}Li

260 Solid State Physics Laboratory
University of Groningen
Melkweg 1
9718 EP Groningen
Netherlands

^{7}Li, TGS

261 Vrije Universiteit
Amsterdam, The Netherlands
Netherlands

^{6}Li, ^{142}Nd, ^{144}Nd, ^{146}Nd, SS, TGS

NORWAY

262 Institutt for Energiteknikk
P. O. Box 40
2007 Kjeller, Norway

^{87}Rb

SCOTLAND

263 Nuclear Enterprises Limited
Sighthill
Edinburgh 11, Scotland

^{6}Li

264 University of Edinburgh
Department of Physics
James Clerk Maxwell Bldg.
Edinburgh EH9 3JZ
Scotland

^{46}Ti

SOUTH AFRICA

265 University of the Orange Free State
The Registrar
P. O. Box 339
Bloemfontein, 9300
South Africa

^{119}Sn

SWEDEN

266 Chalmers Institute of Technology
Attn: Dr. Lars Baltzer
Department of Organic Chemistry
S-412 96 Goteborg
Sweden

^{57}Fe

267 Chalmers Institute of Technology
Department of Biochemistry & Biophysics
S-412 96 Goteborg, Sweden
Attn: Dr. Bengt Reinhammar

^{37}Cl

268 Tandem Accelerator Laboratory
Box 533
S-751 21 Uppsala, Sweden

^{56}Fe, ^{57}Fe, ^{7}Li

269 University of Umea
S-901 87 Umea
Sweden

^{6}Li

SWITZERLAND

270 Fribourg, University of
1700 Fribourg, Switzerland

^{192}Os, ^{114}Sn, SS

271 Nestec, SA
Produits Infantiles et Dietetiques
Avenue Nestle 55
CH-1800 Vevey
Switzerland

^{56}Fe, SS

272 Swiss Institute for Nuclear Research
5234 Villigen, Switzerland

SS

II. ALPHABETICAL LIST OF ISOTOPES, CROSS-REFERENCED TO CUSTOMER NUMBERS

A. DOMESTIC

Barium 135

112, 121, 122

Barium 138

7, 121, 122

Cadmium 106

142

Cadmium 108

142

Cadmium 110

142

Cadmium 111

13, 96, 112, 122, 150

Cadmium 112

36, 62

Cadmium 113

96, 112, 140

Cadmium 114

85, 95, 132

Cadmium 116

58, 78, 82, 115

Calcium 40

50, 63, 142

Calcium 42

66, 69, 74, 75, 92, 93, 106, 113

Calcium 43

2, 66, 113

Calcium 44

1, 36, 50, 58, 66, 72, 75, 92, 93, 113, 114, 121, 135, 140, 149

Calcium 46

75, 128

Calcium 48

18, 50, 61, 63, 72, 113, 122, 149

Cerium 140

122, 157

Cerium 142

122

Chlorine 37

35, 74, 109

Chromium 50

27, 36

Chromium 53

58, 114, 122

Copper 63

1, 33, 59, 78, 97, 121, 129

Copper 65

1, 59, 97, 99, 112, 115, 121, 122, 141

Dysprosium 158

141

Dysprosium 163

122

Erbium 166

6, 91

Erbium 167

29, 91, 122

Erbium 170

112

Europium 151

29

Europium 153

90

Gadolinium 152

54

Gadolinium 154

153

Gadolinium 155

13, 29, 122

Gadolinium 156

60

Gadolinium 158

118

Gadolinium 160

122

Gadolinium High Purity 160

124

Gallium 69

18

Germanium 70

71

Germanium 72

6, 71

Germanium 73

71, 74, 82, 122

Germanium 74

6, 82, 121

Germanium 76

6, 34, 121

Hafnium 177

103, 122

Hafnium 178

24, 29

Hafnium 179

22, 109

Hafnium 180

22, 103

Iridium 191

82, 122

Iridium 193

102, 122

Iron 54

1, 25, 82, 114, 122, 139, 153

Iron 56

11, 35, 59, 70, 114, 116

Iron 57

1, 5, 6, 11, 19, 36, 37, 38, 45, 57, 59, 65, 70, 79, 122, 123, 125, 132, 140, 154

Iron 58

27, 54, 102, 114, 141, 142

Lanthanum 138

29, 146

Lead 204

122

Lead 206

116, 137

Lead 207

90, 118

Lead 208

29, 50, 71, 78, 105, 107, 116, 118, 122, 150, 156

Lithium 6

8, 16, 17, 22, 23, 29, 42, 51, 55, 58, 63, 64, 68, 73, 74, 77, 80, 82, 84, 88, 90, 110, 120, 122, 132, 148, 154, 157

Lithium 7

4, 17, 23, 55, 58, 77, 82, 87, 89, 122, 130, 153

Lutetium 176

24, 29, 40

Magnesium 24

1, 82

Magnesium 25

23

Magnesium 26

1, 23, 91, 115, 122, 136

Mercury 198

111, 122, 150

Mercury 199

124, 150

Mercury 200

97, 111, 122, 150

Mercury 201

150

Mercury 202

44, 90

Mercury 204

97, 111, 133, 150

Molybdenum 92

1, 153

Molybdenum 95

18, 158

Molybdenum 96

1, 82

Molybdenum 98

153

Molybdenum 100

6, 70, 78, 82, 122

Neodymium 144

82

Neodymium 145

29, 122, 146

Neodymium 146

48, 82, 123, 124, 153

Neodymium 148

23

Neodymium 150

23, 121, 143, 146

Nickel 58

1, 18, 23, 36, 49, 74, 82, 150

Nickel 60

6, 23, 70, 82

Nickel 61

37, 47, 65, 93, 154

Nickel 62

1, 122, 153

Nickel 64

6, 70, 72, 82

Osmium 186

122

Osmium 190

26, 65

Osmium 192

23, 102

Palladium 104

80

Palladium 105

15, 122

Palladium 106

80

Palladium 108

15, 80

Palladium 110

80, 81, 82, 122

Platinum 194

145

Platinum 195

23, 82, 98

Platinum 196

18, 98

Platinum 198

108, 122

Potassium 40

61

Potassium 41

36, 116

Rhenium 187

96

Rubidium 85

29, 39, 91, 122, 151

Rubidium 87

14, 39, 41, 43, 48, 91, 96, 126, 144, 151

Ruthenium 99

122

Ruthenium 102

36

Ruthenium 104

34, 121

Samarium 144

82, 90, 151

Samarium 147

82, 109, 122, 126, 143

Samarium 149

48, 146

Samarium 150

125

Samarium 152

23, 124

Samarium High Purity 150

123, 146

Selenium 74

58, 82

Selenium 76

71, 95

Selenium 77

15, 30, 90, 118, 119, 122, 155

Selenium 80

15

Selenium 82

9, 71, 74, 95, 121

Silicon 28

35, 81

Silicon 29

23, 101

Silicon 30

23, 94, 117, 122, 149

Silver 107

71

Special Services

1, 6, 7, 11, 13, 16, 18, 21, 27, 28, 29, 31, 35, 36, 37, 44, 54, 70, 72, 76, 80, 82, 83, 96, 100, 104, 105, 114, 119, 120, 121, 122, 124, 125, 131, 132, 133, 134, 137, 138, 141, 142, 144, 146, 149, 152, 153, 157, 159

Strontium 84

36, 82, 96, 115, 151

Strontium 86

90

Strontium 87

37, 112

Strontium 88

121

Sulfur 32

63

Sulfur 33

119, 122

Sulfur 34

10, 63

Target Preparation Stable

4, 6, 13, 23, 32, 46, 50, 52, 60, 63, 82, 89, 91, 121, 122, 125, 129, 138, 139, 149, 150

Tellurium 122

56, 82, 93, 121

Tellurium 123

82, 96

Tellurium 124

67, 82, 86

Tellurium 125

96, 122

Tellurium 126

78, 82

Tellurium 128

91

Tellurium 130

91

Thallium 203

36, 49, 115, 122, 153, 157

Tin 112

82

Tin 116

1, 125, 134

Tin 117

71, 74, 138

Tin 118

11, 70, 71, 82, 122

Tin 119

3, 96, 122, 146

Tin 120

20

Tin 122

96

Titanium 46

65, 82

Titanium 47

12, 37

Titanium 49

122

Titanium 50

82, 142

Tungsten 182

122

Tungsten 183

122

Tungsten 184

122

Tungsten 186

36, 76, 82, 122, 125, 141

Ytterbium 168

42, 56, 82, 141

Ytterbium 170

122

Ytterbium 171

29, 122

Ytterbium 172

7

Ytterbium 176

125

Zinc 64

1, 13, 53, 58

Zinc 66

13

Zinc 67

53, 114, 122, 140

Zinc 68

1, 13, 36, 58, 63, 67, 75, 115

Zinc 70

53, 54, 63, 127, 147

Zinc High Purity 70
121, 141
Zirconium 90
1, 103
Zirconium 91
29, 65, 122
Zirconium 92
6, 137
Zirconium 94
6, 36, 103

B. FOREIGN

Barium 135
183
Bromine 79
249
Bromine 81
249
Cadmium 106
192
Cadmium 110
257
Cadmium 111
226
Cadmium 113
175, 226, 246, 251
Cadmium 114
252
Cadmium 116
249
Calcium 40
229, 249
Calcium 42
162, 190, 222, 249, 258
Calcium 43
173
Calcium 44
162, 190, 200, 222, 245, 249, 254, 258
Calcium 46
166, 173, 189, 191
Calcium 48
173, 228, 249
Cerium 136
173, 174
Cerium 140
191, 249
Cerium 142
181
Chlorine 35
162, 236, 249
Chlorine 37
162, 200, 236, 267
Chromium 50
164, 171, 197, 216, 221, 229, 249, 254
Chromium 52
197, 248
Chromium 53
249
Chromium 54
197
Copper 63
165, 242, 249
Copper 65
170, 249
Dysprosium 160
249
Dysprosium 163
183
Erbium 166
174, 197
Erbium 167
181, 198, 244
Erbium 168
193
Gadolinium 155
181, 235, 244, 249
Gadolinium 156
197
Gadolinium 157
183, 235
Gadolinium 158
168
Gadolinium 160
173

Gallium 69

250

Germanium 70

179, 202, 220, 249

Germanium 72

179, 249

Germanium 74

197, 220, 249

Germanium 76

193, 207, 249

Hafnium 174

249

Hafnium 176

214

Hafnium 179

198

Iridium 191

173

Iron 54

164, 192, 193, 197, 249

Iron 56

197, 268

Iron 57

162, 163, 165, 167, 219, 241, 249, 250, 255, 266, 268

Iron 58

271

Lanthanum 138

173, 181, 204, 244

Lead 204

162, 172, 184

Lead 206

217, 249

Lead 207

217, 244, 249, 257

Lead 208

217, 228, 249

Lead High Purity 208

173

Lithium 6

162, 196, 200, 201, 203, 212, 213, 224, 232, 233, 236, 240, 249, 252, 256, 259, 261, 263, 269

Lithium 7

249, 260, 268

Lutetium 176

181, 183, 184, 249

Magnesium 24

249, 250

Magnesium 25

249, 258

Magnesium 26

249

Mercury 204

234, 249

Molybdenum 92

227, 249

Molybdenum 94

249

Molybdenum 98

221, 224, 229, 242

Molybdenum 100

221, 249

Neodymium 142

187, 261

Neodymium 144

261

Neodymium 145

174

Neodymium 146

200, 206, 225, 261

Neodymium 148

197

Neodymium 150

181, 208

Nickel 58

171, 228, 230, 245, 249, 254

Nickel 60

228, 230

Nickel 62

197, 228, 249

Nickel 64

221, 249

Osmium 184

249

Osmium 187
205, 229, 239
Osmium 188
249
Osmium 190
173, 249
Osmium 192
161, 172, 270
Palladium 104
202, 235
Palladium 105
173, 202
Palladium 108
173, 188
Palladium 110
221, 238
Platinum 190
249
Platinum 192
223, 249
Platinum 194
164, 173, 198, 249
Platinum 195
235
Platinum 196
161, 235
Platinum 198
172, 257
Potassium 39
178, 249
Potassium 40
183, 249
Potassium 41
160, 200
Rubidium 85
183, 249, 250
Rubidium 87
177, 249, 262
Ruthenium 98
221
Ruthenium 99
173, 239, 249
Ruthenium 102
175
Ruthenium 104
175, 202, 230, 239
Samarium 147
185, 197
Samarium 148
193, 197
Samarium 149
167, 197, 231
Samarium 150
197, 250
Samarium 152
162, 197, 249
Selenium 74
193, 249
Selenium 76
169
Selenium 80
237
Selenium 82
172, 176, 234
Silicon 28
249
Silicon 29
209
Silicon 30
209
Silver 107
172
Silver 109
220
Special Services
167, 171, 172, 179, 180, 181, 182, 183, 187, 191, 192, 193, 198, 207, 210, 214, 215, 217, 221, 228, 231, 237, 245, 248, 249, 252, 261, 270, 271, 272
Strontium 84
177, 183, 186, 191, 194, 218, 243, 244, 253, 258
Strontium 86
249
Strontium 88
161

Sulfur 32
207
Sulfur 33
175, 228
Target Preparation Stable
162, 179, 182, 211, 214, 226, 228, 230, 235, 238, 248, 249, 250, 260, 261
Tellurium 122
188
Tellurium 123
227
Tellurium 124
198, 227, 235
Tellurium 125
249
Tellurium 126
188, 249
Tellurium 128
249
Tellurium 130
161, 220, 237
Thallium 203
247
Tin 112
210
Tin 114
270
Tin 116
228, 249, 265
Tin 117
172, 173, 195
Tin 118
197, 228
Tin 119
173, 241
Tin 120
228
Tin 122
198
Tin 124
195, 228
Titanium 46
197, 249, 264
Titanium 47
193, 249
Titanium 48
164, 182, 230, 249
Titanium 50
249
Tungsten 182
193
Tungsten 184
179, 193
Tungsten 186
193
Ytterbium 168
199
Ytterbium 171
174, 181, 183, 244
Ytterbium 173
211, 235
Ytterbium 176
197, 249
Zinc 64
197, 249
Zinc 66
197, 249
Zinc 67
249
Zinc 68
247, 249
Zirconium 90
172, 230, 238
Zirconium 91
174, 183
Zirconium 92
172
Zirconium 94
172
Zirconium 96
221

III. ALPHABETICAL LIST OF STATES AND COUNTRIES, CROSS-REFERENCED TO CUSTOMER NUMBERS

A. DOMESTIC

Alabama

2, 11, 12

Arizona

7, 118, 119

California

14, 21, 22, 23, 27, 51, 56, 58, 100, 101, 111, 120, 121, 123, 145

Colorado

99, 115, 126, 127

Connecticut

57, 128, 158

District of Columbia

24

Florida

42, 129, 130, 131

Georgia

45, 110

Hawaii

48

Idaho

40

Illinois

5, 6, 70, 79, 80, 98, 124, 132

Indiana

50, 81, 93

Iowa

52, 53, 54

Kentucky

133, 134, 135

Louisiana

114

Maryland

59, 63, 74, 75, 85, 136

Massachusetts

17, 26, 28, 32, 36, 39, 47, 64, 65, 137, 138, 156

Michigan

33, 34, 68, 69, 139

Minnesota

66, 140

Mississippi

72

Missouri

62, 141

New Jersey

13, 30, 38, 67, 91, 96, 112

New Mexico

97, 122

New York

3, 10, 18, 20, 29, 37, 41, 43, 44, 46, 77, 78, 94, 95, 102, 113, 151, 159

North Carolina

35

Ohio

16, 31, 55, 60, 83, 92, 117, 125

Oklahoma

84, 90

Oregon

86, 87, 103

Pennsylvania

25, 88, 89, 104, 142, 152

Rhode Island

19, 143

South Carolina

144

Tennessee

9, 82, 105, 157

Texas

1, 49, 61, 106, 107, 108, 109, 146, 147, 148

Utah

73

Virginia

116, 149

Washington

8, 15, 71, 76, 150, 153

Wisconsin

4, 154, 155

B. FOREIGN

Australia

160, 161, 162, 163, 164, 165

Belgium

166, 167, 168, 169

Canada

170, 171, 172, 173, 174, 175, 176,
177, 178, 179, 180, 181, 182

China

183,184,185

Denmark

186, 187, 188, 189

England

190,191,192,193,194,195,196,197,
198,199,200,201,202,203

France

204, 205, 206, 207, 208, 209

Israel

241

Italy

242, 243, 244, 245, 246

Japan

247, 248, 249, 250, 251, 252

Korea

253, 254, 255

Netherlands

256, 257, 258, 259, 260, 261

Norway

262

Scotland

263, 264

South Africa

265

Sweden

266, 267, 268, 269

Switzerland

270, 271, 272

West Germany

210,211,212,213,214,215,216,
217,218,219,220,221,222,223,
224,225,226,227,228,229,230,
231,232,233,234,235,236,237,
238,239,240

IV. STABLE ISOTOPE SALES AND SERVICES - FY 1987

EM Stable Isotopes Sales

ISOTOPE	DOMESTIC			FOREIGN			PROJECT			TOTAL		
	SHIP	MILLIGRAMS	DOLLARS	SHIP	MILLIGRAMS	DOLLARS	SHIP	MILLIGRAMS	DOLLARS	SHIP	MILLIGRAMS	DOLLARS
BARIUM-135				1	136.0	150	2	600.0	534	3	736.0	684
BARIUM-138	1	600.0	150				2	9157.0	1020	3	9757.0	1170
BROMINE-79				1	50.0	817				1	50.0	817
BROMINE-81				1	50.0	867				1	50.0	867
CADMIUM-106	1	25.0	621	1	100.0	2450				2	125.0	3071
CADMIUM-108	1	25.0	741							1	25.0	741
CADMIUM-110	1	50.0	190	1	50.0	190				2	100.0	380
CADMIUM-111	4	421.0	1685	2	120.0	545	1	50.0	182	7	591.0	2412
CADMIUM-112	2	20000.0	45000							2	20000.0	45000
CADMIUM-113	4	165.0	768	4	650.0	3022				8	815.0	3790
CADMIUM-114	3	2800.0	1400	1	20000.0	10000				4	22800.0	11400
CADMIUM-116	3	300.0	795	1	53.0	150	2	470.0	1043	6	823.0	1988
CALCIUM-40	3	3260.0	2445	3	1750.0	1312				6	5010.0	3757
CALCIUM-42	11	1427.0	39233	7	991.0	27202	2	315.0	8646	20	2733.0	75083
CALCIUM-43	2	2.0	741	1	3.0	1007				3	5.0	1748
CALCIUM-44	17	16473.0	116607	9	4955.0	35101	3	2032.0	13516	29	23460.0	165224
CALCIUM-46	1	2.0	3731	4	45.0	83961	1	2.0	3731	6	49.0	91424
CALCIUM-48	6	85.0	21863	4	44.0	11273	2	94.0	18072	12	223.0	51209
CERIUM-136				2	15.0	546				2	15.0	546
CERIUM-140				2	19000.0	950	2	1860.0	300	4	20860.0	1250
CERIUM-142				1	67.0	100	1	100.0	150	2	167.0	250
CHLORINE-35				3	910.0	595				3	910.0	595
CHLORINE-37	2	85.0	680	4	658.0	5334	1	19.0	152	7	762.0	6166
CHROMIUM-50	2	950.0	10582	13	1635.0	17955				15	2585.0	28537
CHROMIUM-52				3	8247.0	5195				3	8247.0	5195
CHROMIUM-53	1	30.0	156	1	50.0	267	2	90.0	417	4	170.0	840
CHROMIUM-54				1	100.0	4125				1	100.0	4125
COPPER-63	5	1849.0	1387	3	600.0	450	3	1135.0	719	11	3584.0	2556
COPPER-65	4	526.0	920	3	2185.0	3825	5	1375.0	2032	12	4086.0	6777
DYSPROSIUM-158	1	50.0	705							1	50.0	705
DYSPROSIUM-160				1	103.0	150				1	103.0	150
DYSPROSIUM-163				1	600.0	150	1	600.0	150	2	1200.0	300

IV. STABLE ISOTOPE SALES AND SERVICES - FY 1987 (Cont'd)

EM Stable Isotopes Sales (Cont'd)

ISOTOPE	DOMESTIC			FOREIGN			PROJECT			TOTAL		
	SHIP	MILLIGRAMS	DOLLARS	SHIP	MILLIGRAMS	DOLLARS	SHIP	MILLIGRAMS	DOLLARS	SHIP	MILLIGRAMS	DOLLARS
ERBIUM-166	1	700.0	105	2	766.0	200	1	1000.0	127	4	2466.0	432
ERBIUM-167	2	722.0	325	3	1600.0	400	1	600.0	150	6	2922.0	875
ERBIUM-168				1	750.0	150				1	750.0	150
ERBIUM-170	1	500.0	150							1	500.0	150
EUROPIUM-151	1	106.0	150							1	106.0	150
EUROPIUM-153	1	263.0	100							1	263.0	100
GADOLINIUM-152	1	163.0	3455							1	163.0	3455
GADOLINIUM-154							1	15.0	150	1	15.0	150
GADOLINIUM-155	2	590.0	925	4	556.0	880	1	100.0	150	7	1246.0	1955
GADOLINIUM-156	1	150.0	112	1	166.0	100				2	316.0	212
GADOLINIUM-157				2	192.0	285				2	192.0	285
GADOLINIUM-158	2	728.0	255	1	400.0	150				3	1128.0	405
GADOLINIUM-160				1	91.0	150				1	91.0	150
GADOLINIUM-160 H.P.	1	10.0	215							1	10.0	215
GALLIUM-69				1	500.0	275	1	500.0	225	2	1000.0	500
GERMANIUM-70	1	50.0	150	4	747.0	2017				5	797.0	2167
GERMANIUM-72	1	100.0	165	2	379.0	545	1	500.0	686	4	979.0	1396
GERMANIUM-73	1	100.0	715				3	111.0	656	4	211.0	1371
GERMANIUM-74				4	2200.0	4950	3	818.0	1502	7	3018.0	6452
GERMANIUM-76	1	500.0	4100	4	570.0	4674	2	318.0	2186	7	1388.0	10960
HAFNIUM-174				1	1.0	719				1	1.0	719
HAFNIUM-176				1	50.0	615				1	50.0	615
HAFNIUM-177	1	100.0	150				1	100.0	150	2	200.0	300
HAFNIUM-178	2	130.0	300							2	130.0	300
HAFNIUM-179	1	150.0	112	1	70.0	150				2	220.0	262
HAFNIUM-180	2	200.0	300							2	200.0	300
IRIDIUM-191				1	40.0	150	3	80.0	346	4	120.0	496
IRIDIUM-193	1	95.0	199				1	50.0	150	2	145.0	349
IRON-54	3	277.0	1512	7	748.0	4117	6	2228.0	10453	16	3253.0	16083
IRON-56	4	3540.0	1416	2	625.0	250	2	5400.0	1721	8	9565.0	3387

IV. STABLE ISOTOPE SALES AND SERVICES - FY 1987 (Cont'd)

EM Stable Isotopes Sales (Cont'd)

ISOTOPE	DOMESTIC			FOREIGN			PROJECT			TOTAL		
	SHIP	MILLIGRAMS	DOLLARS	SHIP	MILLIGRAMS	DOLLARS	SHIP	MILLIGRAMS	DOLLARS	SHIP	MILLIGRAMS	DOLLARS
IRON-57	22	2957.0	43203	21	1765.0	24616	3	861.0	10429	46	5583.0	78249
IRON-58	7	222.0	23778	1	30.0	3220	1	2.0	214	9	254.0	27213
LANTHANUM-138	2	14.0	615	4	49.0	2153				6	63.0	2768
LEAD-204				2	110.0	885	1	50.0	305	3	160.0	1190
LEAD-206	1	111.0	150	4	1511.0	2040	1	112.0	150	6	1734.0	2340
LEAD-207	2	250.0	250	4	2700.0	2700				6	2950.0	2950
LEAD-208	10	6750.0	4050	4	1775.0	1140	2	6740.0	3161	16	15265.0	8351
LEAD-208 H.P.				1	74.0	425				1	74.0	425
LUTETTIUM-176	2	6.0	767	4	13.0	1529	1	30.0	1255	7	49.0	3551
MAGNESIUM-24	1	200.0	150	4	985.0	823	1	50.0	150	6	1235.0	1123
MAGNESIUM-25				3	250.0	1962	1	20.0	134	4	270.0	2096
MAGNESIUM-26	3	119.0	1263	4	450.0	4590	3	81.0	700	10	650.0	6553
MERCURY-198	1	10.0	178				3	110.0	1876	4	120.0	2054
MERCURY-199	2	18.0	366							2	18.0	366
MERCURY-200	2	22.0	540				2	63.0	1395	4	85.0	1935
MERCURY-201	1	10.0	216							1	10.0	216
MERCURY-202	2	65.0	997							2	65.0	997
MERCURY-204	3	38.0	842	2	70.0	1526	1	200.0	3591	6	308.0	5959
MOLYBDENUM- 92	1	500.0	150	2	228.0	300	1	600.0	150	4	1328.0	600
MOLYBDENUM- 94				1	20.0	150				1	20.0	150
MOLYBDENUM- 95	1	1134.0	283				1	1056.0	210	2	2190.0	493
MOLYBDENUM- 96	1	500.0	150				1	50.0	150	2	550.0	300
MOLYBDENUM- 98				4	800.0	1240	1	97.0	150	5	897.0	1390
MOLYBDENUM-100	2	1000.0	400	2	360.0	270	5	3050.0	1234	9	4410.0	1904
NEODYMIUM-142				3	1140.0	2109				3	1140.0	2109
NEODYMIUM-144				1	525.0	183	1	43.0	150	2	568.0	333
NEODYMIUM-145	2	316.0	300	1	111.0	100	1	100.0	150	4	527.0	550
NEODYMIUM-146	3	376.0	453	4	3333.0	1500	2	354.0	300	9	4063.0	2253
NEODYMIUM-148				2	317.0	270	1	46.0	150	3	363.0	420
NEODYMIUM-150	2	160.0	250	2	152.0	280	2	122.0	250	6	434.0	780

IV. STABLE ISOTOPE SALES AND SERVICES - FY 1987 (Cont'd)

EM Stable Isotopes Sales (Cont'd)

ISOTOPE	DOMESTIC			FOREIGN			PROJECT			TOTAL		
	SHIP	MILLIGRAMS	DOLLARS	SHIP	MILLIGRAMS	DOLLARS	SHIP	MILLIGRAMS	DOLLARS	SHIP	MILLIGRAMS	DOLLARS
NICKEL-58	5	49300.0	24650	8	21900.0	11465	5	167520.0	78044	18	238720.0	114159
NICKEL-60	1	800.0	200	2	50.0	300	5	154600.0	52548	8	155450.0	53048
NICKEL-61	5	132.0	2033							5	132.0	2033
NICKEL-62	1	13.0	150	3	145.0	1411	2	63.0	622	6	221.0	2183
NICKEL-64	2	119.0	2176	2	115.0	2150	3	347.0	5399	7	581.0	9725
OSMIUM-184				2	2.0	544				2	2.0	544
OSMIUM-186							1	16.0	4581	1	16.0	4581
OSMIUM-187				3	200.0	2780				3	200.0	2780
OSMIUM-188				1	100.0	2480				1	100.0	2480
OSMIUM-190	2	165.0	1237	2	42.0	304				4	207.0	1542
OSMIUM-192	1	45.0	195	3	450.0	1957	1	10.0	100	5	505.0	2253
PALLADIUM-104	1	808.0	1155	2	150.0	547				3	958.0	1702
PALLADIUM-105				2	145.0	311	2	196.0	379	4	341.0	691
PALLADIUM-106	1	313.0	377							1	313.0	377
PALLADIUM-108	1	257.0	374	3	450.0	787	1	90.0	157	5	797.0	1319
PALLADIUM-110	2	603.0	1812	3	4069.0	13844	2	100.0	300	7	4772.0	15956
PLATINUM-190				1	1.0	170				1	1.0	170
PLATINUM-192				11	70.0	1365				11	70.0	1365
PLATINUM-194	1	500.0	1699	5	786.0	3340				6	1286.0	5039
PLATINUM-195	1	944.0	4484	1	130.0	617	2	1300.0	5292	4	2374.0	10393
PLATINUM-196	1	1090.0	4796	2	240.0	1056	1	62.0	188	4	1392.0	6040
PLATINUM-198	2	40.0	300	2	150.0	1125	1	50.0	303	5	240.0	1728
POTASSIUM-39				2	330.0	380				2	330.0	380
POTASSIUM-40	1	10.0	818	2	53.0	2650				3	63.0	3468
POTASSIUM-41	1	115.0	2196	2	40.0	764	1	10.0	191	4	165.0	3151
RHENIUM-187	1	29.0	100							1	29.0	100
RUBIDIUM-85	4	930.0	2864	4	812.0	1795	1	100.0	150	9	1842.0	4809
RUBIDIUM-87	12	3063.0	25002	5	930.0	7623				17	3993.0	32625
RUTHENIUM- 98				1	100.0	3510				1	100.0	3510
RUTHENIUM- 99				4	484.0	2178	1	50.0	189	5	534.0	2367
RUTHENIUM-102	1	200.0	490	1	200.0	490				2	400.0	980
RUTHENIUM-104	1	2000.0	5900	4	550.0	1622	1	225.0	537	6	2775.0	8059

IV. STABLE ISOTOPE SALES AND SERVICES - FY 1987 (Cont'd)

EM Stable Isotopes Sales (Cont'd)

ISOTOPE	DOMESTIC			FOREIGN			PROJECT			TOTAL		
	SHIP	MILLIGRAMS	DOLLARS	SHIP	MILLIGRAMS	DOLLARS	SHIP	MILLIGRAMS	DOLLARS	SHIP	MILLIGRAMS	DOLLARS
SAMARIUM-144	2	58.0	919				1	20.0	100	3	78.0	1019
SAMARIUM-147	3	186.0	437	2	200.0	470	2	250.0	491	7	636.0	1398
SAMARIUM-148				3	642.0	464				3	642.0	464
SAMARIUM-149	2	900.0	300	3	2235.0	559				5	3135.0	859
SAMARIUM-150	1	250.0	100	2	650.0	260				3	900.0	360
SAMARIUM-152	1	231.0	150	5	1209.0	850	1	50.0	150	7	1490.0	1150
SAMARIUM-150 H.P.	2	40.0	303							2	40.0	303
SELENIUM-74	1	10.0	969	2	55.0	10298	1	60.0	8375	4	125.0	19643
SELENIUM-76	2	130.0	697	1	250.0	1337				3	380.0	2034
SELENIUM-77	5	1130.0	15989				2	22.0	305	7	1152.0	16295
SELENIUM-80				1	2000.0	2200	1	86.0	150	2	2086.0	2350
SELENIUM-82	3	75.0	2120	4	165.0	4568	2	160.0	4307	9	400.0	10995
SILICON-28	2	416.0	375	1	2000.0	1800				3	2416.0	2175
SILICON-29	1	300.0	7425	2	112.0	2772	1	16.0	327	4	428.0	10524
SILICON-30	3	199.0	8845	2	88.0	3916	2	20.0	736	7	307.0	13497
SILVER-107	1	115.0	150	1	359.0	161				2	474.0	311
SILVER-109				1	254.0	150				1	254.0	150
STRONTIUM-84	3	197.0	11248	12	210.0	12026	1	40.0	1761	16	447.0	25036
STRONTIUM-86	1	700.0	105	1	1000.0	150				2	1700.0	255
STRONTIUM-87	2	1400.0	683							2	1400.0	683
STRONTIUM-88				2	350.0	300	1	1000.0	320	3	1350.0	620
SULFUR-32	1	300.0	150	1	300.0	150				2	600.0	300
SULFUR-33	1	55.0	167	2	50.0	996	1	5.0	343	4	110.0	1507
SULFUR-34	2	335.0	590	1	85.0	150				3	420.0	740
TELLURIUM-122	2	130.0	2483	1	10.0	191	3	136.0	2199	6	276.0	4873
TELLURIUM-123	1	7.0	190	1	60.0	1488	1	5.0	71	3	72.0	1749
TELLURIUM-124	3	60020.0	651217	2	280.0	3038	1	10.0	83	6	60310.0	654338
TELLURIUM-125	1	21.0	150	1	150.0	1050	1	50.0	349	3	221.0	1549
TELLURIUM-126	1	100.0	165	2	300.0	495	1	17.0	23	4	417.0	683
TELLURIUM-128	2	400.0	520	1	500.0	650				3	900.0	1170
TELLURIUM-130	2	600.0	570	3	5700.0	5415				5	6300.0	5985
THALLIUM-203	6	351000.0	581700	1	19329.0	32859	3	689.0	979	10	371018.0	615538

IV. STABLE ISOTOPE SALES AND SERVICES - FY 1987 (Cont'd)

EM Stable Isotopes Sales (Cont'd)

ISOTOPE	DOMESTIC			FOREIGN			PROJECT			TOTAL		
	SHIP	MILLIGRAMS	DOLLARS	SHIP	MILLIGRAMS	DOLLARS	SHIP	MILLIGRAMS	DOLLARS	SHIP	MILLIGRAMS	DOLLARS
TIN-112				1	3640.0	76986	1	80.0	899	2	3720.0	77885
TIN-114				2	125.0	2088				2	125.0	2088
TIN-116	3	910.0	500	3	713.0	400				6	1623.0	900
TIN-117	2	1125.0	461	3	934.0	525	1	335.0	150	6	2394.0	1137
TIN-118	3	2515.0	2892	2	225.0	265	4	4250.0	3984	9	6990.0	7141
TIN-119	4	1928.0	675	2	1000.0	350	1	450.0	150	7	3378.0	1175
TIN-120	1	617.0	150	1	125.0	150				2	742.0	300
TIN-122	1	166.0	150	1	200.0	180				2	366.0	330
TIN-124				2	218.0	300				2	218.0	300
TITANIUM-46	1	35.0	231	4	1720.0	11370	1	300.0	1628	6	2055.0	13229
TITANIUM-47	2	125.0	925	2	320.0	2368				4	445.0	3293
TITANIUM-48				5	836.0	887				5	836.0	887
TITANIUM-49							1	50.0	429	1	50.0	429
TITANIUM-50	1	100.0	1125	1	500.0	5625	1	600.0	5602	3	1200.0	12352
TUNGSTEN-182				1	500.0	150	3	4610.0	991	4	5110.0	1141
TUNGSTEN-183								1015.0	396		1015.0	396
TUNGSTEN-184				2	875.0	350	1	790.0	216	3	1665.0	566
TUNGSTEN-186	3	3003.0	1501	1	500.0	250	3	4016.0	1533	7	7519.0	3284
YTTERBIUM-168	3	15.0	2223	1	5.0	1552	1	2.0	473	5	22.0	4248
YTTERBIUM-170							1	27.0	150	1	27.0	150
YTTERBIUM-171	1	150.0	150	4	591.0	503	1	177.0	150	6	918.0	803
YTTERBIUM-172	1	250.0	212							1	250.0	212
YTTERBIUM-173				2	1650.0	1155				2	1650.0	1155
YTTERBIUM-176	1	30.0	190	2	200.0	1300				3	230.0	1490
ZINC-64	4	865.0	1990	5	800.0	1840				9	1665.0	3830
ZINC-66	1	300.0	495	2	300.0	495				3	600.0	990
ZINC-67	2	41.0	606	1	50.0	740	2	300.0	4307	5	391.0	5653
ZINC-68	7	96457.0	410029	4	36155.0	153725	1	5000.0	21250	12	137612.0	585004
ZINC-70	9	185.0	12029				2	22.0	1273	11	207.0	13302
ZINC-70 H.P.	2	4.0	676				1	10.0	1403	3	14.0	2079

IV. STABLE ISOTOPE SALES AND SERVICES - FY 1987 (Cont'd)

EM Stable Isotopes Sales (Cont'd)

ISOTOPE	DOMESTIC			FOREIGN			PROJECT			TOTAL		
	SHIP	MILLIGRAMS	DOLLARS	SHIP	MILLIGRAMS	DOLLARS	SHIP	MILLIGRAMS	DOLLARS	SHIP	MILLIGRAMS	DOLLARS
ZIRCONIUM-90	2	364.0	255	3	560.0	510				5	924.0	765
ZIRCONIUM-91	2	20.0	300	2	27.0	393	1	50.0	601	5	97.0	1294
ZIRCONIUM-92	1	76.0	150	1	200.0	390	1	500.0	733	3	776.0	1273
ZIRCONIUM-94	2	2100.0	7350	1	200.0	700	1	500.0	1502	4	2800.0	9552
ZIRCONIUM-96				1	100.0	8690				1	100.0	8690
TOTAL	343	665239.0	2161679	408	214892.0	723068	178	394015.0	313444	929	1274146.0	3198191

Non EM Stable Isotopes Sales

LITHIUM-6	30	8778.0	16635	20	25168.0	24323	10	26596.0	12538	60	60542.0	53496
LITHIUM-7	9	3806.0	4995	4	7300.0	25150	4	6135.0	3147	17	17241.0	33292

Special Services

			72847			204363			76590			353800

Targets

			31010			56996			58824			146830

INTERNAL DISTRIBUTION

1. H. L. Adair
2-3. H. H. Caudill
4. R. L. Cline
5. D. M. Ferren
6. C. L. Johnson
7-8. H. T. Milton
9-13. J. A. Setaro
14. J. H. Swanks
15-20. J. G. Tracy
21. A. Zucker
22. Laboratory Records - RC
23-24. Laboratory Records Department
25. ORNL Patent Section
26. Central Research Library
27-28. ORNL— Y-12 Technical Library Document Reference Section

EXTERNAL DISTRIBUTION

29. D. A. Baker, Battelle Pacific Northwest Laboratory, Battelle Blvd., Richland, WA 99352
30. J. L. Burnett, Processes & Techniques Branch, Div. of Chemical Sciences, Office of Basic Energy Sciences (ER-142) GTN, MS-G-226, DOE, Washington, DC 20545
31. M. M. Dare, Finance Division, DOE-ORO, Oak Ridge, TN 37831
32. Assistant Manager for Energy Research and Development, DOE-ORO, Oak Ridge, TN 37831
33. R. S. Marianelli, Processes & Techniques Branch, Div. of Chemical Sciences, Office of Basic Energy Sciences (ER-142) GTN, MS-G-236, DOE, Washington, DC 20545
34. John Pantateo, MA 302.2, DOE, 1000 Independence Avenue, Washington, DC 20585
35. R. J. Starks, Eagle-Picher Industries, Inc., P. O. Box 1090, Miami, OH 74354
36. D. K. Stevens, Associate Director, Office of Basic Energy Sciences (ER-10) GTN, MS-G-226, DOE, Washington, DC 20545
37. R. E. Vallee, Monsanto Research Corporation, Miamisburg, OH 45342
38. S. J. Wolfe, Energy Programs, DOE-ORO, Oak Ridge, TN 37831
39-48. Technical Information Center, Box 62, Oak Ridge, TN 37831