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ORNL/TM--8979

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## OPERATIONS DIVISION

### STABLE ISOTOPE CUSTOMER LIST AND SUMMARY OF SHIPMENTS — FY 1983

Compiled by

W. C. Davis

Date Published: December 1983

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STABLE ISOTOPE CUSTOMER LIST AND SUMMARY

OF SHIPMENTS - FY 1983

W. C. Davis

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:

1. alphabetical list of domestic and foreign customers, showing the stable isotopes purchased during the fiscal year;
2. alphabetical list of isotopes, cross-referenced to customer numbers and divided into domestic and foreign categories;
3. alphabetical list of states and countries, cross-referenced to customer numbers and indicating geographical concentrations of isotope users; and
4. tabulation of the shipments, quantities, and dollars for domestic, foreign, and project categories for each isotope.

Other reports in this series are:

ORNL/TM-1928	ORNL/TM-3146	ORNL/TM-5089	ORNL/TM-7214
ORNL/TM-2038	ORNL/TM-3543	ORNL/TM-5853	ORNL/TM-7764
ORNL/TM-2401	ORNL/TM-3987	ORNL/TM-6241	ORNL/TM-8302
ORNL/TM-2747	ORNL/TM-5089	ORNL/TM-6710	ORNL/TM-8704

We wish to thank Becky Verastegui of the Business Systems Department of the ORGDP Computing Technology Center for her assistance in developing the tabulations.

## 1. ALPHABETICAL LIST OF CUSTOMERS, WITH CONTACTS AND ISOTOPE PURCHASED

## A. DOMESTIC

- 1 Abilene Christian College  
Box 8208  
Abilene, Texas 79699  
<sup>54</sup>Fe, <sup>99</sup>Mo, <sup>60</sup>Ni, <sup>63</sup>Ni
- 2 Albert Einstein College of Medicine  
1300 Morris Park Avenue  
Bronx, New York 10461  
<sup>54</sup>Fe
- 3 Argonne National Laboratory  
9700 South Cass Avenue  
Argonne, Illinois 60439  
<sup>40</sup>Ca, <sup>110</sup>Cd, <sup>63</sup>Cu, <sup>65</sup>Cu, <sup>152</sup>Eu, <sup>54</sup>Fe,  
<sup>150</sup>Gd, <sup>152</sup>Gd, <sup>154</sup>Gd, <sup>6</sup>Li, <sup>7</sup>Li, <sup>144</sup>Nd,  
<sup>146</sup>Nd, <sup>148</sup>Nd, <sup>60</sup>Ni, <sup>62</sup>Ni, <sup>64</sup>Ni, <sup>208</sup>Pb,  
<sup>207</sup>Pb, <sup>209</sup>Pb, <sup>76</sup>Se, <sup>76</sup>Si, <sup>144</sup>Sm,  
<sup>115</sup>Sn, <sup>117</sup>Sn, <sup>119</sup>Sn, SS, TOS, <sup>175</sup>Yb,  
<sup>90</sup>Zr
- 4 Arizona Public Service Co.  
P. O. Box 21232 Station 1840  
Phoenix, Arizona 85036  
<sup>7</sup>Li
- 5 Arizona, University of  
Post Office Drawer 4100  
Tucson, Arizona 85721  
<sup>35</sup>Cl, <sup>152</sup>Sm
- 6 Atomergic Chemicals Corporation  
100 Fairchild Avenue  
Plainville, N. Y. 11803  
<sup>6</sup>Li, <sup>67</sup>Zn
- 7 Becton Dickinson  
Box 821  
Rutherford, New Jersey 07070  
<sup>107</sup>Ag
- 8 Bell Telephone Laboratories  
Murray Hill, New Jersey 07971  
<sup>54</sup>Fe, <sup>99</sup>Mo
- 9 Brigham & Women's Hospital  
Accounts Payable  
10 Vining Street  
Boston, Massachusetts 02115  
<sup>100</sup>W
- 10 Brookhaven National Laboratory  
Upton, Long Island, New York 11973  
<sup>11</sup>B, <sup>40</sup>Ca, <sup>63</sup>Cu, <sup>150</sup>Dy, <sup>152</sup>Dy, <sup>76</sup>Ge,  
<sup>177</sup>Hf, <sup>150</sup>Mg, <sup>6</sup>Li, <sup>150</sup>Pd, <sup>152</sup>Pd,  
<sup>154</sup>Pd, <sup>101</sup>Ru, <sup>76</sup>Se, <sup>115</sup>Sn, <sup>117</sup>Sn, SS,  
<sup>100</sup>W, <sup>100</sup>W, <sup>67</sup>Zn
- 11 California Institute of Technology  
Accounts Payable 301-6  
Pasadena, California 91125  
<sup>51</sup>Cr, <sup>54</sup>Fe, <sup>57</sup>Fe, <sup>60</sup>Mg, <sup>63</sup>Ti
- 12 California, University of  
Davis, California 95616  
<sup>6</sup>Li, <sup>7</sup>Li
- 13 California, University of  
405 Hilgard Avenue  
Los Angeles, California 90024  
<sup>151</sup>Dy, <sup>153</sup>Dy, <sup>157</sup>Er, <sup>150</sup>Gd, <sup>144</sup>Nd,  
<sup>175</sup>Yb
- 14 California, University of  
Accounting Office  
P. O. Box 112  
Riverside, California 92521  
<sup>54</sup>Fe
- 15 California, University of  
Santa Barbara, California 93106  
<sup>144</sup>Nd
- 16 California, University of  
Lawrence Berkeley Laboratory  
Berkeley, California 94701  
<sup>99</sup>Mo, SS
- 17 California, University of  
Lawrence Livermore Laboratory  
Box 808  
Livermore, California 94550  
<sup>40</sup>Ca, <sup>48</sup>Ca, <sup>99</sup>Mo, <sup>100</sup>Mo, <sup>144</sup>Nd, <sup>146</sup>Nd,  
<sup>148</sup>Nd, <sup>150</sup>Pd, <sup>152</sup>Pd, <sup>154</sup>Pd, <sup>156</sup>Pt, SS,  
TOS, <sup>100</sup>W, <sup>67</sup>Zn, <sup>76</sup>Zn, <sup>90</sup>Zr
- 18 Carnegie-Mellon University  
5000 Forbes  
Pittsburgh, Pennsylvania 15213  
<sup>99</sup>Mo, <sup>100</sup>Mo, <sup>100</sup>Mo
- 19 Chem Impex International  
P. O. Box 21820  
6105 South 31st Street  
Greenfield, Wisconsin 53221  
Attn: Nitin Shah  
<sup>110</sup>Cd, <sup>112</sup>Cd
- 20 Childrens Medical Center  
300 Longwood Avenue  
Boston, Massachusetts 02115  
<sup>55</sup>Co
- 21 City College  
136 Street and Convent Avenue  
New York, New York 10031  
<sup>107</sup>Ag, <sup>63</sup>Cu, TOS
- 22 Colorado School of Mines  
Post Office Box 112  
Golden, Colorado 80402  
<sup>6</sup>Li

- 23 Colorado State University  
Fort Collins, Colorado 80521  
 $^{63}\text{Cu}$ ,  $^{65}\text{Cu}$
- 24 Columbia University  
Box 6, Low Library  
New York, New York 10027  
 $^{76}\text{Se}$ ,  $^{78}\text{Se}$
- 25 Connecticut, University of  
Physical Sciences Bldg.  
Storrs, Connecticut 06268  
 $^{56}\text{Fe}$ ,  $^{55}\text{Fe}$
- 26 Dartmouth College  
Sillsby Hall  
Hanover, New Hampshire 03755  
 $^{208}\text{Pb}$ ,  $^{209}\text{Pb}$
- 27 Department of Chemistry  
Mount Holyoke College  
South Hadley, Massachusetts 01075  
 $^{125}\text{Te}$
- 28 Drew University  
Pepin Service Center - Purchasing  
36 Madison Avenue  
Madison, New Jersey 07940  
 $^{115}\text{Sn}$
- 29 Duke University  
Durham, North Carolina 27706  
 $^{56}\text{Fe}$ ,  $^{203}\text{Hg}$
- 30 E G & O Idaho, Inc.  
Accounts Payable Section  
P. O. Box 1625  
Idaho Falls, Idaho 83415  
 $^{90}\text{Sr}$
- 31 Eagle-Pitcher Industries, Inc.  
P.O. Box 798  
Ouelpa, Oklahoma 74363  
 $^7\text{Li}$
- 32 Eastman Kodak Company  
Kodak Park Division  
Rochester, New York 14650  
 $^{136}\text{G}$ ,  $^{76}\text{Se}$ ,  $^{125}\text{Te}$
- 33 Energy Conversion Devices  
P. O. Box 5357  
North Branch, New Jersey 08876  
 $^{115}\text{Sn}$
- 34 Esso Research and Engineering Company  
P. O. Box 642  
Linden, New Jersey 07036  
 $^{56}\text{Fe}$ ,  $^{105}\text{Pd}$
- 35 Florida State University  
Tallahassee, Florida 32306  
 $^{56}\text{Fe}$ ,  $^{203}\text{Hg}$
- 36 Florida, University of  
Gainesville, Florida 32601  
 $^{51}\text{Cr}$ ,  $^{55}\text{Fe}$
- 37 Furman University  
Greenville, South Carolina 29613  
 $^{28}\text{Si}$
- 38 Georgia Institute of Technology  
225 North Avenue, N.W.  
Atlanta, Georgia 30332  
 $^{60}\text{Ni}$ ,  $^{241}\text{Pu}$
- 39 Georgia, University of  
Athens, Georgia 30601  
 $^{60}\text{Ni}$
- 40 GTE Products Corporation  
Lighting Products Group  
100 Endicott Street  
Danvers, Massachusetts 01923  
 $^{200}\text{Hg}$ ,  $^{201}\text{Hg}$ ,  $^{202}\text{Hg}$ ,  $^{55}\text{Fe}$
- 41 Harshaw Chemical Company  
Division of Keweenaw Oil Company  
6801 Cochran Road  
Selen, Ohio 44139  
 $^6\text{Li}$
- 42 Harvard University  
Geological Museum  
24 Oxford Street  
Cambridge, Massachusetts 02138  
 $^{137}\text{Ba}$ ,  $^{60}\text{Co}$ ,  $^{137}\text{Cs}$ ,  $^{150}\text{Dy}$ ,  $^{90}\text{Er}$ ,  
 $^{152}\text{Eu}$ ,  $^{154}\text{Gd}$ ,  $^{180}\text{Hf}$ ,  $^{138}\text{La}$ ,  $^{176}\text{Lu}$ ,  
 $^{203}\text{Hg}$ ,  $^{200}\text{Mo}$ ,  $^{150}\text{Nd}$ ,  $^{208}\text{Pb}$ ,  $^{209}\text{Pb}$ ,  
 $^{87}\text{Rb}$ ,  $^{151}\text{Sm}$ ,  $^{90}\text{Sr}$ ,  $^{176}\text{Yb}$ ,  $^{90}\text{Zr}$
- 43 Hawaii, University of  
Honolulu, Hawaii 96822  
 $^6\text{Li}$ ,  $^7\text{Li}$
- 44 Hewlett Packard Company  
1501 Page Mill Road  
Palo Alto, California 94304  
 $^{86}\text{Rb}$ ,  $^{87}\text{Rb}$
- 45 Indiana University  
Bloomington, Indiana 47401  
 $^6\text{Li}$ ,  $^7\text{Li}$ ,  $^{60}\text{Ni}$ ,  $^{225}\text{Ac}$ ,  $^{226}\text{Ac}$ ,  $^{76}\text{Se}$ ,  $^{90}\text{Sr}$ ,  
 $^{115}\text{Sn}$ ,  $^{65}\text{Zn}$
- 46 Iowa, University of  
Iowa City, Iowa 52240  
 $^7\text{Li}$

- 47 Isotec, Incorporated  
7542 McEwen Road  
Dayton, Ohio 45459  
 $^{59}\text{Fe}$ , TOS
- 48 Isotope Products Laboratories  
404 South Luke Street  
Burbank, California 91502  
 $^{152}\text{Eu}$ ,  $^{154}\text{Eu}$
- 49 J. T. Baker Chemical Co.  
Phillipsburg, N.J. 08865  
 $^{19}\text{F}$
- 50 Kaman Instrumentation Corp.  
P. O. Box 7463  
Colorado Springs, Colorado 80933  
TOS
- 51 Kentucky, University of  
Lexington, Kentucky 40506  
 $^{195}\text{Pt}$ , SS
- 52 Krueger Enterprises, Inc.  
24 Blackstone Street  
Cambridge, Massachusetts 02139  
 $^{86}\text{Rb}$ ,  $^{87}\text{Sr}$ ,  $^{90}\text{Sr}$
- 53 Litten Industries  
Guidance and Control Systems  
5500 Canoga Avenue  
Woodland Hills, California 91367  
 $^{86}\text{Rb}$ ,  $^{87}\text{Rb}$
- 54 Lockheed Engineering & Mgmt. Services C  
1830 NASA Road 1  
Houston, Texas 77258  
 $^{180}\text{Hf}$ , SS
- 55 Loras College  
Dubuque, Iowa 52001  
 $^{64}\text{Cu}$ ,  $^{66}\text{Cu}$ ,  $^{59}\text{Fe}$
- 56 Louisiana State University  
Nuclear Science Center  
Baton Rouge, Louisiana 70803  
 $^{147}\text{Nd}$ , TOS
- 57 Mallinckrodt, Inc.  
2703 Wagner Place  
Maryland Heights, Missouri 63043  
 $^{203}\text{Tl}$
- 58 Maryland, University of  
College Park, Maryland 20742  
 $^7\text{Li}$ ,  $^{34}\text{S}$
- 59 Massachusetts Institute of Technology  
Box 69  
Cambridge, Massachusetts 02139  
 $^{44}\text{Ca}$ ,  $^{63}\text{Cu}$ ,  $^{65}\text{Cu}$ ,  $^{59}\text{Fe}$ ,  $^{203}\text{Hg}$ ,  $^{205}\text{Hg}$ ,  
 $^{203}\text{Po}$ ,  $^{205}\text{Po}$ ,  $^{207}\text{Sb}$ ,  $^{209}\text{Sb}$ ,  $^{119}\text{Sn}$ , SS,  
TOS,  $^{184}\text{W}$ ,  $^{176}\text{Yb}$ ,  $^{66}\text{Zn}$ ,  $^{68}\text{Zn}$
- 60 Medi-Physics, Inc.  
5855 Christie Avenue  
Emeryville, California 94608  
 $^{109}\text{Cd}$ ,  $^{109}\text{Te}$ ,  $^{125}\text{Te}$ ,  $^{203}\text{Tl}$ ,  $^{65}\text{Zn}$
- 61 Medical College of Wisconsin  
8700 W. Wisconsin Avenue  
Milwaukee, Wisconsin 53226  
 $^{64}\text{Cu}$ ,  $^{67}\text{Cu}$
- 62 Miami University  
Oxford, Ohio 45056  
 $^{18}\text{O}$
- 63 Michigan State University  
East Lansing, Michigan 48823  
 $^{44}\text{Ca}$
- 64 Michigan, University of  
Ann Arbor, Michigan 48104  
 $^{147}\text{Nd}$ ,  $^{147}\text{Sm}$
- 65 Microfolia  
P. O. Box 283  
Argonne, Illinois 60439  
SS,  $^{203}\text{Tl}$
- 66 MicroMatter Company  
Route 1, Box 728  
Eastsound, Washington 98245  
SS,  $^{90}\text{Zr}$ ,  $^{91}\text{Zr}$
- 67 Minnesota Mining and Manufacturing Comp  
Post Office Box 3121  
St. Paul, Minnesota 55101  
 $^6\text{Li}$
- 68 Missouri, University of  
Columbia, Missouri 65201  
 $^{163}\text{Dy}$ ,  $^{115}\text{Sn}$
- 69 Monsanto Research Corporation  
Dayton Laboratory  
1515 Nicholas Road  
Dayton, Ohio 45407  
 $^8\text{B}$
- 70 Monsanto Research Corporation  
Mound Laboratory  
P. O. Box 32  
Miamisburg, Ohio 45342  
 $^{123}\text{Te}$ ,  $^{125}\text{Te}$ ,  $^{127}\text{Te}$ ,  $^{131}\text{Te}$ ,  $^{65}\text{Zn}$
- 71 Mount Sinai Medical Center  
4300 Alton Road  
Miami Beach, Florida 33139  
 $^{65}\text{Zn}$

- 72 National Bureau of Standards  
Connecticut Avenue and Van Ness Street,  
Washington, D. C. 20234  
<sup>6</sup>Li, <sup>33</sup>Se
- 73 National Institutes of Health  
Accounts Payable DFM/Alin: Louise Clar  
9000 Rockville Pike  
Building 31, Room 81033  
Bethesda, Maryland 20205  
<sup>45</sup>Ca, <sup>48</sup>Ca, <sup>51</sup>Fe, <sup>6</sup>Li, <sup>7</sup>Li, <sup>76</sup>Se, SS
- 74 New American Mt. Zion  
2025 E. 7th Avenue  
Port Angeles, Washington 98362  
<sup>115</sup>Sn
- 75 New England Nuclear  
85 Wells Avenue  
Newton, Massachusetts 02159  
<sup>112</sup>Cd, <sup>103</sup>Tl, <sup>66</sup>Zn
- 76 New Hampshire, University of  
Durham, New Hampshire 03824  
<sup>140</sup>Nd, <sup>208</sup>Pb, <sup>147</sup>Sm
- 77 New Mexico, University of  
Albuquerque, New Mexico 87103  
<sup>87</sup>Rb, <sup>88</sup>Sr
- 78 New York, State University of  
1400 Washington Avenue  
Albany, New York 12203  
<sup>57</sup>Fe
- 79 New York, State University of  
Research Foundation  
Stony Brook New York 11790  
<sup>140</sup>Er, <sup>170</sup>Hf, <sup>180</sup>Hf, <sup>208</sup>Pb, <sup>137</sup>Sa
- 80 North Carolina, University of  
Chapel Hill, North Carolina 27514  
<sup>56</sup>Fe, <sup>88</sup>Sr
- 81 North Dakota, University of  
Grand Forks, North Dakota 58201  
<sup>64</sup>Cu
- 82 Northwestern University  
619 Clark Street  
Evanston, Illinois 60201  
<sup>110</sup>Pd, SS
- 83 Notre Dame, University of  
Notre Dame, Indiana 46556  
<sup>107</sup>Ag, <sup>100</sup>Pd
- 84 Ohio State University  
190 North Oval Drive  
Columbus, Ohio 43210  
<sup>24</sup>Mg, <sup>170</sup>Yb
- 85 Ohio State University  
Research Foundation  
1314 Kinnear Road  
Columbus, Ohio 43212  
<sup>57</sup>Fe, <sup>24</sup>Mg, <sup>140</sup>Nd, <sup>147</sup>Sm, <sup>115</sup>Sn
- 86 Ohio University  
Athens, Ohio 45701  
<sup>33</sup>S, SS, <sup>187</sup>W, <sup>184</sup>W
- 87 Oregon Graduate Center  
19800 Northwest Walker Road  
Beaverton, Oregon 97005  
<sup>64</sup>Cu
- 88 Oregon State University  
Corvallis, Oregon 97330  
<sup>100</sup>Gd, <sup>140</sup>Nd, <sup>105</sup>Si, <sup>147</sup>Sm, <sup>170</sup>Yb
- 89 Oregon, University of  
Eugene, Oregon 97403  
<sup>120</sup>Te
- 90 Pennsylvania State University  
University Park, Pennsylvania 16802  
<sup>78</sup>Br
- 91 Pennsylvania, University of  
3025 Walnut Street  
Philadelphia, Pennsylvania 19104  
<sup>54</sup>Fe, <sup>70</sup>Ge, <sup>74</sup>Ge, <sup>76</sup>Ge, <sup>208</sup>Pb, <sup>76</sup>Se,  
<sup>78</sup>Se, <sup>77</sup>Se, <sup>78</sup>Se, <sup>80</sup>Se, <sup>82</sup>Se, 105
- 92 Princeton University  
James Forrestal Campus  
Princeton, New Jersey 08540  
<sup>64</sup>Cu, <sup>140</sup>Dy, <sup>180</sup>Dy, <sup>57</sup>Fe, <sup>70</sup>Ge, <sup>208</sup>Pb,  
<sup>88</sup>Rb, <sup>87</sup>Rb, <sup>66</sup>Zn
- 93 Purdue University  
Pharmacy Annex  
Lafayette, Indiana 47907  
<sup>64</sup>Cu, <sup>64</sup>Cu, <sup>140</sup>Dy, <sup>140</sup>Er, <sup>147</sup>Er,  
<sup>140</sup>Er, <sup>56</sup>Fe, <sup>57</sup>Fe, <sup>170</sup>Hf, <sup>100</sup>Pd,  
<sup>100</sup>Pd, <sup>100</sup>Ru, <sup>101</sup>Ru, <sup>122</sup>Sb, SS
- 94 RadPharm, Incorporated  
828 Mahler Road  
Burlingame, California 94010  
<sup>112</sup>Cd, <sup>120</sup>Te
- 95 Research Foundation of the City  
University of New York  
RF #06074  
1515 Broadway  
New York, New York 10021  
<sup>48</sup>Ca, <sup>33</sup>S, SS, <sup>66</sup>Zn
- 96 Rochester, University of  
575 Elmwood Avenue  
Rochester, New York 14627  
<sup>138</sup>Ba, <sup>140</sup>Er, <sup>33</sup>S, <sup>170</sup>Yb

- 97 Rockwell International  
Atomics International Division  
Rocky Flats Plant  
P. O. Box 484  
Golden, Colorado 80401  
  
\*\*Pb
- 98 Reyspec Purchasing Services  
7470 Candlewood Road  
Hermans, Maryland 21077  
  
\*\*Ti
- 99 Rutgers, The State University  
New Brunswick, New Jersey 08903  
  
\*Li, \*Li, \*\*Se
- 100 San Diego State University  
San Diego University Foundation  
5178 College Avenue  
San Diego, California 92182  
  
\*\*K, \*\*Rb, \*\*Sr
- 101 Sanders Nuclear Corporation  
95 Canal Street  
Nashua, New Hampshire 03080  
  
\*Li
- 102 Schlumberger Well Services  
A Division of Schlumberger Technology C  
Post Office Box 2175  
Houston, Texas 77001  
  
\*Li
- 103 South Carolina, University of  
Columbia, South Carolina 29208  
  
\*\*Se
- 104 Stanford University  
P. O. Box 4409  
Stanford, California 94305  
  
\*\*Cd, \*\*Cd, \*\*Cd, \*\*Mg, \*\*Pd,  
\*\*Pd, \*\*Si, \*\*Te, \*\*Te, \*\*Te,  
\*\*Te
- 105 Stohler Isotope Chemicals Inc.  
49 Jones Road  
Waltham, Massachusetts 02154  
  
\*Li
- 106 Teledyne Isotopes  
123 Woodland Avenue  
Westwood, New Jersey 07675  
  
\*Li, \*\*Pb
- 107 Tennessee Valley Authority  
Chattanooga Accounting Office  
295 Hanes Bldg.  
Chattanooga, Tennessee 37401  
  
\*Li
- 108 Tennessee, University of  
Knoxville, Tennessee 37918  
  
\*\*Dy, TOS
- 109 Texas at Dallas, University of  
P. O. Box 30365  
Dallas, Texas 75230  
  
\*\*Ca
- 110 Texas A and M University  
Post Office Box 44  
College Station, Texas 77843  
  
\*Li, \*\*Nd, \*\*Sm
- 111 Texas, University of  
Austin, Texas 78712  
  
\*\*Cu, \*\*Cu, \*Li, \*\*Sr
- 112 The Standard Oil Co. Research  
Attn: Accounts Payable  
4440 Warrenville Center Road  
Cleveland, Ohio 44128  
  
\*\*Sn
- 113 U. S. Geological Survey  
1020 O'Brien Drive  
Menlo Park, Ca 94025  
  
\*\*Ca, \*\*Rb, \*\*Yb
- 114 U.S. Department of Agriculture  
ARS, NCR, RAO, Contracts Branch  
ADP & Equipment Contracts Section  
Room 412, Bldg. 003, BARC-West  
Beltsville, Maryland 20705  
  
\*\*Se
- 115 U.S. Services, Inc.  
19 Ox Bow Lane  
Summit, New Jersey 07901  
  
\*\*Pb
- 116 Union Carbide Corporation  
Sterling Forest Research Center  
Post Office Box 324  
Tuxedo, New York 10987  
  
\*\*Cr, SS
- 117 Union Carbide Corporation, Nuclear Div  
Oak Ridge National Laboratory  
Post Office Box X  
Oak Ridge, Tennessee 37830  
  
\*\*Ba, \*\*Ca, \*\*Ca, \*\*Cd, \*\*Cd, \*\*Cr,  
\*\*Er, \*\*Eu, \*\*Fe, \*\*Fe, \*\*Gd,  
\*\*Gd, \*\*Hf, \*\*Hf, \*\*Hf, \*\*K, \*Li,  
\*Li, \*\*Mo, \*\*Ni, \*\*Pb, \*\*Pb, \*\*Pd,  
\*\*S, \*\*S, \*\*Se, \*\*Sn, \*\*Sn, \*\*Sn,  
\*\*Sn, \*\*Sr, \*\*Sr, SS, \*\*Te, \*\*Te,  
TOS, \*\*Ti, \*\*Ti, \*\*W, \*\*W, \*\*W,  
\*\*Yb, \*\*Yb, \*\*Zn, \*\*Zn, \*\*Zn, \*\*Zr
- 118 Union Carbide Corporation, Nuclear Div  
Y-12 Plant  
Post Office Box Y  
Oak Ridge, Tennessee 37830  
  
SS, TOS, \*\*Ti



- 119 Union Science and Technology Division  
P.O. Box 76  
Brea, California 92621  
<sup>109</sup>Mo
- 120 United States Department of Agriculture  
Research Service  
P. O. Box 53326  
New Orleans, Louisiana 70150  
<sup>44</sup>Ca, <sup>63</sup>Cu, <sup>65</sup>Cu, <sup>54</sup>Fe, <sup>55</sup>Fe, <sup>24</sup>Mg,  
<sup>66</sup>Zn, <sup>67</sup>Zn, <sup>68</sup>Zn
- 121 United States Department of Interior  
Geology Survey  
Bldg. 21, Denver Federal Center  
Denver, Colorado 80225  
<sup>140</sup>Nd
- 122 United States Geological Survey  
Financial Management  
National Center, Room 1447-A  
12201 Sunrise Valley Drive  
Reston, Virginia 22092  
<sup>42</sup>Ca, <sup>151</sup>Sm
- 123 United States Navy  
Naval Research Laboratory  
Washington, D. C. 20390  
<sup>57</sup>Fe, <sup>235</sup>U, TOS
- 124 University of Arkansas  
Purchasing Section-321 Admn. Bldg.  
Fayetteville, Arkansas 72701  
<sup>235</sup>U
- 125 University of California  
P. O. Box CA  
Irvine, California 92718  
<sup>40</sup>Ca, SS
- 126 University of California  
Los Alamos National Laboratory  
Accounting Dept.  
P. O. Box 1663  
Los Alamos, New Mexico 87545  
<sup>40</sup>Ca, <sup>100</sup>Co, <sup>63</sup>Cu, <sup>100</sup>Er, <sup>170</sup>Er, <sup>41</sup>K,  
<sup>140</sup>Nd, <sup>144</sup>Nd, <sup>150</sup>Nd, <sup>190</sup>Os, <sup>208</sup>Pb,  
<sup>208</sup>Pb, <sup>87</sup>Rb, <sup>151</sup>Sm, <sup>152</sup>Sm, <sup>153</sup>Sm,  
<sup>120</sup>Sn, <sup>86</sup>Sr, SS, <sup>120</sup>Te, TOS, <sup>40</sup>Tl,  
<sup>80</sup>Tl
- 127 University of Chicago  
Account Payable  
1525 E. Hyde Park Boulevard  
Chicago, Illinois 60615  
<sup>152</sup>Dy, <sup>100</sup>Os
- 128 University of Cincinnati  
Purchasing Department  
Cincinnati, Ohio 45221  
<sup>100</sup>Os, <sup>119</sup>Sn, <sup>100</sup>W
- 129 University of Connecticut  
Health Center  
Accounts Payable, Bldg. #18  
Farmington, Connecticut 06032  
<sup>119</sup>Sn, <sup>119</sup>Sn
- 130 University of Illinois at Urbana-Champaign  
242 Administration Bldg.  
Office of Business Affairs  
Accounting Division  
508 South Wright Street  
Urbana, Illinois 61801  
<sup>114</sup>Cd, <sup>100</sup>Co, <sup>100</sup>Co, <sup>63</sup>Cu, <sup>100</sup>Er,  
<sup>54</sup>Fe, <sup>24</sup>Mg, <sup>100</sup>Mo, <sup>24</sup>S, SS, TOS, <sup>67</sup>Zn
- 131 University of Massachusetts  
Amherst, Massachusetts 01003  
<sup>7</sup>Li
- 132 University of Minnesota  
Business Office  
1919 University Avenue  
St. Paul, Minnesota 55104  
<sup>208</sup>Pb, TOS
- 133 University of Texas  
P.O. Box 888  
Richardson, Texas 75080  
<sup>107</sup>Ag, <sup>108</sup>Ag, <sup>63</sup>Cu, <sup>65</sup>Cu, <sup>57</sup>Fe, TOS
- 134 Utah, University of  
Purchasing Department  
Salt Lake City, Utah 84112  
<sup>40</sup>Ca, <sup>40</sup>Ca, <sup>57</sup>Fe, <sup>24</sup>Mg
- 135 V. A. Hospital, Durham  
Calm-VA-2-(558)  
P. O. Box 2972  
Austin, Texas 78769  
<sup>100</sup>Mo, <sup>235</sup>U, <sup>235</sup>U
- 136 Vanderbilt University  
Business Managers Office  
Nashville, Tennessee 37203  
<sup>40</sup>Ca, <sup>40</sup>Ca, <sup>208</sup>Pb, TOS
- 137 Virginia, University of  
Charlottesville, Virginia 22903  
<sup>7</sup>Li, TOS
- 138 Washington State University  
Comptroller's Office  
Pullman, Washington 99163  
<sup>66</sup>Zn
- 139 Washington University  
Lindell and Shinker  
St. Louis, Missouri 63130  
<sup>140</sup>Nd, <sup>140</sup>Nd, <sup>150</sup>Nd, <sup>87</sup>Rb, <sup>151</sup>Sm,  
<sup>152</sup>Sm, <sup>86</sup>Sr

140 Washington, University of  
400 Administration Building  
Seattle, Washington 98105  
<sup>51</sup>Cr, <sup>55</sup>Fe, <sup>107</sup>Hf, <sup>108</sup>Hf, <sup>40</sup>K, <sup>99</sup>Mo,  
<sup>137</sup>Sr, <sup>88</sup>Sr, TOS, <sup>103</sup>Tl

141 Wayne State University  
Detroit, Michigan 48202  
<sup>6</sup>Li

142 Westinghouse Electric Corporation  
Gott's Atomic Paper Laboratory  
Post Office Box 79  
West Mifflin, Pennsylvania 15122  
<sup>100</sup>Er, <sup>107</sup>Er, SS, <sup>90</sup>Zr, <sup>91</sup>Zr, <sup>92</sup>Zr

143 Westinghouse Electric Corporation  
Research and Development Center  
Beulah Road, Churchill Borough  
Pittsburgh, Pennsylvania 15235  
SS, <sup>90</sup>Zr

144 Westinghouse Hanford Company  
P. O. Box 1870  
Richland, Washington 99352  
<sup>100</sup>Gd

145 Wisconsin, University of  
750 University Avenue  
Madison, Wisconsin 53706  
<sup>40</sup>Ca, <sup>174</sup>Yb

146 Wyoming, University of  
Laramie, Wyoming 82070  
<sup>54</sup>Fe, <sup>199</sup>Hg, <sup>60</sup>Ni, <sup>62</sup>Ni, <sup>64</sup>Ni, <sup>66</sup>Ni,  
<sup>68</sup>Ni, SS

147 Xerox  
3333 Coyote Hill Road  
Palo Alto, California 94304  
<sup>115</sup>Sn

148 Yale University  
20 Ashmun Street  
New Haven, Connecticut 06520  
<sup>90</sup>Ca, <sup>208</sup>Pb, TOS

## B. FOREIGN

### AUSTRALIA

149 Australian National University  
P. O. Box 4  
Canberra, A. C. T., Australia  
<sup>130</sup>Ba, <sup>132</sup>Ba, <sup>151</sup>Eu, <sup>176</sup>Lu, <sup>208</sup>Pb,  
<sup>209</sup>Bi, SS

150 CSIRO  
Regional Administrative Office  
9 Queen's Road  
Melbourne, Australia 3004  
<sup>90</sup>Ga

151 La Trobe University  
Bundoora, Victoria  
Australia 3083  
<sup>75</sup>Se

152 Melbourne, University of  
School of Physics  
Parkville, Victoria 3052  
Melbourne, Australia  
<sup>48</sup>Ca, <sup>35</sup>Cl, <sup>37</sup>Cl, <sup>60</sup>Ni, <sup>62</sup>Ni, <sup>64</sup>Ni,  
SS, <sup>104</sup>W

153 The Accountant  
Australian Atomic Energy Commission,  
Private Mail Bag,  
Sutherland, 2232, NSW  
Australia  
<sup>103</sup>Si

154 University, Queensland  
St. Lucia, Q. 4067,  
Australia  
<sup>55</sup>Fe

### AUSTRIA

155 IAEA  
Wagramerstrasse 5  
P. O. Box 100  
A-1400  
Vienna, Austria  
<sup>103</sup>Si, TOS

### BELGIUM

156 Central Bureau for Nuclear Measurements  
of the European Communities  
B-2440 GEEL, Steenweg naar Rottie  
Belgium  
<sup>60</sup>Ni, <sup>62</sup>Ni, <sup>64</sup>Ni, <sup>66</sup>Ni, <sup>103</sup>Si, SS

157 Katholieke Universiteit Leuven  
Instituut Voor Kern-En Stralingsfysika  
Celestijnenlaan 200 D  
3030 Leuven, Belgium  
<sup>99</sup>Mo, <sup>127</sup>Te, <sup>128</sup>Te, TOS

158 SCK-CEN Laboratories  
Boeretang, 200  
B-2400 MOL, Belgium  
<sup>152</sup>Eu

### BRAZIL

159 Comissao Nacional de Energia Nuclear  
Rua General Severiano  
90-Botafogo  
Rio de Janeiro, Brazil  
<sup>99</sup>Mo, <sup>103</sup>Tl, <sup>66</sup>Zn

160 Conselho Nacional De Desenvolvimento  
Cientifico E Tecnol6gico - CNPQ  
Av. H/3 Norte 0.507 Lote 2  
Brasilia - DF  
Brazil

<sup>115</sup>Sn

161 Universidade Federal do Para  
Nucleo de Ciencias Geofisicas E Geologi  
Campus Universita  
rio do Guama-C. P. 16111  
Belem-Para-66000  
Brazil

<sup>133</sup>Ce, <sup>152</sup>Er, <sup>152</sup>Eu, <sup>188</sup>Od, <sup>138</sup>La,  
<sup>144</sup>Nd, <sup>208</sup>Pb, <sup>86</sup>Rb, <sup>147</sup>Sm, <sup>84</sup>Sr,  
<sup>171</sup>Yb

## CANADA

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

<sup>60</sup>Ni, <sup>61</sup>Ni

163 Atomic Energy of Canada Limited  
Triumph, UBC  
4004 Wesbrook Mall  
Vancouver, B.C.  
V6T 2A3  
Canada

<sup>113</sup>Cd, <sup>114</sup>Cd, <sup>208</sup>Pb

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

<sup>138</sup>La, <sup>24</sup>Mg, <sup>28</sup>Si, SS

165 Atomic Energy of Canada Ltd.  
Radiochemical Co.  
413 March Road  
P.O. Box 13500  
Kanata, Ontario K2K 1X8

<sup>138</sup>Ce, <sup>59</sup>Fe, <sup>60</sup>Ni, <sup>62</sup>Ni, <sup>110</sup>Pd, SS,  
<sup>66</sup>Zn

166 British Columbia, University of  
Vancouver B, B.C., Canada

<sup>24</sup>Mg, <sup>130</sup>Te, TOS

167 Erindale College  
University Of Toronto  
3399 Mississauga Road  
Mississauga, Ontario, Canada L5L 1C6

<sup>76</sup>Se

168 Manitoba, University of  
Winnipeg, Manitoba, Canada

<sup>60</sup>Ni, <sup>86</sup>Rb, <sup>87</sup>Rb, <sup>88</sup>Sr, SS, <sup>130</sup>Te

169 McMaster University  
Hamilton, Ontario, Canada

<sup>50</sup>Cr, <sup>52</sup>Cr, <sup>150</sup>Dy, <sup>180</sup>Hf, <sup>70</sup>Zn

170 Montreal, Universite de  
Montreal, Canada

TOS, <sup>90</sup>Zr

171 National Research Council  
Montreal Road Laboratories  
Ottawa, Ontario, Canada

<sup>107</sup>Ag, <sup>63</sup>Cu, <sup>65</sup>Cu, <sup>119</sup>Sn, <sup>99</sup>Tl

172 Queens University  
Kingston, Ontario, Canada

<sup>90</sup>Mo, TOS, <sup>90</sup>Zr

173 S.Y.E.P. #1002 #24  
c/o P. O. Box 1000  
Agassiz, British Columbia V0M 1A0  
Canada

<sup>76</sup>Se, <sup>76</sup>Se

174 Universite Laval  
Service des Approvisionnements  
C.P. 2208  
Quebec, Canada GLK 7P4

<sup>61</sup>Li, <sup>99</sup>Tl

175 University of Alberta  
Edmonton, Alberta, Canada T6G2H1

TOS

176 Victoria, University of  
P. O. Box 1700  
Victoria, B. C., Canada

<sup>61</sup>Ni

177 X-Ray Assay Laboratories  
1885 Leslie Street  
Don Mills, Ontario M3B 3J4  
Canada

<sup>138</sup>Ce, <sup>113</sup>Cd, <sup>52</sup>Cr, <sup>63</sup>Cu, <sup>59</sup>Fe, <sup>208</sup>Pb,  
<sup>32</sup>S, SS, <sup>66</sup>Zn

## CHILE

178 Comision Chilena de Energia Nuclear  
Import Department  
Castilla 188 - D  
Santiago, Chile

<sup>61</sup>Li

## CHINA

179 Institute of Nuclear Energy Research  
P. O. Box 3  
Leng-Ten, Taiwan, China

<sup>24</sup>S

## DENMARK

180 Kobenhavns Universitet  
Niels Bohr Institutet  
Tandem Accelerator Laboratory  
Riso, 4000 Roskilde  
Denmark

<sup>152</sup>Eu, <sup>188</sup>Od, <sup>138</sup>Od

181 Kobenhavns Universitet  
Niels Bohr Institutet  
Kemi-Afdelingen  
Blegdamsvej 17, 2100 Kobenhavn O  
Denmark  
dEnuArK

<sup>152</sup>Od

182 Psychiatric Hospital  
Attn: Dr. Klaus Thomsen  
DK-8240 Risskov  
Denmark

$^{60}\text{Li}$

183 Riso National Laboratory  
DK-4000 Roskilde  
Denmark

$^{40}\text{Ca}$ ,  $^{208}\text{Pb}$ ,  $^{88}\text{Sr}$

#### ENGLAND

184 Amer sham International Limited  
White Lion Road Amer sham  
Buckinghamshire England HP7 9LL

$^{40}\text{Ca}$ ,  $^{132}\text{Ce}$ ,  $^{52}\text{Cr}$ ,  $^{56}\text{Fe}$ ,  $^{100}\text{Hf}$ ,  $^{118}\text{Sn}$ ,  
 $^{84}\text{Sr}$ ,  $^{86}\text{Sr}$ ,  $^{98}\text{Zr}$ ,  $^{100}\text{Zr}$ ,  $^{102}\text{Yb}$

185 Derby Luminescents Ltd.  
Levy West Division  
Millmarsh Lane, Brimsdown  
Enfield, Middx. EN3 7GW  
England

$^{60}\text{Li}$

186 Leeds, University of  
Leeds 2, England

$^{132}\text{Ce}$ ,  $^{138}\text{Gd}$ ,  $^{100}\text{Hf}$ ,  $^{138}\text{La}$ ,  $^{175}\text{Lu}$ ,  
 $^{90}\text{Zr}$

187 Liverpool, University of  
Liverpool 3, England

$^{140}\text{Nd}$

188 Manchester University  
Manchester 13, England

$^{138}\text{Ba}$ ,  $^{162}\text{Dy}$ ,  $^{164}\text{Dy}$ ,  $^{167}\text{Er}$ ,  $^{54}\text{Fe}$ ,  
 $^{112}\text{In}$ ,  $^{127}\text{Sn}$ ,  $^{120}\text{Te}$ ,  $^{123}\text{Te}$

189 St. Mary's Hospital Medical School  
Norfolk Pl. Paddington  
London W2 1PO, England

$^{63}\text{Cu}$

190 Sussex, University of  
Brighton, Sussex, England

$^{203}\text{Hg}$ ,  $^{201}\text{Hg}$

191 The Open University  
Finance Division  
Sherwood House  
Bletchley, Milton Keynes  
Buckinghamshire, England

$^{40}\text{Ca}$ ,  $^{138}\text{La}$ ,  $^{175}\text{Lu}$ ,  $^{140}\text{Nd}$ ,  $^{88}\text{Sr}$

192 University of London, King's College  
The Strand  
London W.C.2R, 2LS  
England

$^{88}\text{Sr}$ ,  $^{90}\text{Sr}$ , TOS

193 University College London Faculty of  
Clinical Sciences, The Rayne Institute  
Department of Medicine  
5 University Street  
London, WC1E 6JJ  
England

$^{40}\text{Ca}$ ,  $^{76}\text{Se}$

194 UK Freight Forwarding Office  
25 Broadway  
New York, New York 10004

$^{57}\text{Fe}$ ,  $^{107}\text{Pd}$ ,  $^{109}\text{Pd}$ ,  $^{105}\text{Pd}$ ,  $^{140}\text{Nd}$ ,  
 $^{90}\text{Sr}$ ,  $^{92}\text{Sr}$ ,  $^{152}\text{Sm}$ ,  $^{154}\text{Sm}$ ,  $^{150}\text{Sm}$ ,  
 $^{114}\text{Sn}$ ,  $^{120}\text{Te}$ ,  $^{90}\text{Zr}$ ,  $^{94}\text{Zr}$

195 Vinten Instruments Limited  
Jessemy Road  
Weybridge, Surrey KT13 8LE  
England

$^{60}\text{Li}$

#### FINLAND

196 Technical Research Centre of Finland  
Reactor Laboratory  
Olaksari 3 A  
SF-02150 Espoo 15  
Finland

$^{203}\text{Hg}$

#### FRANCE

197 CEA  
Department des Radioelements  
B. P. No. 2  
91190 Orf Sur Yvette, France

$^{138}\text{La}$ ,  $^{235}\text{U}$ ,  $^{88}\text{Sr}$

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

$^{207}\text{Pb}$

199 Mns. Philibert  
LA10 Volcanologie - 5 Rue Kessler  
83038 Clermont-Ferrand Cedex  
France

$^{143}\text{Nd}$

#### GERMANY

200 American Hoechst Corporation  
P. O. Box 2500  
Somerville, New Jersey 08876

$^{50}\text{Cr}$ ,  $^{199}\text{Hg}$ , 55

201 Bonn, Universitat  
Nussallee 12-14  
55 Bonn, Germany

$^{135}\text{Cl}$ ,  $^{37}\text{Cl}$

202 Buchler and Company  
Frankfurter Str. 294  
Braunschweig, Germany

$^{60}\text{Li}$ ,  $^{203}\text{Pt}$ , TOS,  $^{175}\text{Yb}$

- 203 Bundesanstalt, Physikalisch-Technische  
Bundesallee 100  
Braunschweig, Germany  
<sup>107</sup>Ag
- 204 Darmstadt, Technische Hochschule  
61 Darmstadt, Germany  
<sup>140</sup>Dy, <sup>100</sup>Er, <sup>208</sup>Pb, <sup>209</sup>Pb, <sup>192</sup>Sm,  
TOS, <sup>176</sup>Yb
- 205 Erlangen-Nurnberg, University  
Gluckstr.  
952 Erlangen, West Germany  
<sup>118</sup>Fa, SS
- 206 EURATOM Transuranium Institute  
P. O. Box 452  
75 Karlsruhe, West Germany  
<sup>100</sup>Pu
- 207 Fachbereich Physik  
der TU-Munchen  
Strehlenschulzebl. Z 62  
James-Frank-Weg  
D-8046 Garching B. Munchen, West German  
<sup>001</sup>Ca, <sup>1</sup>Li, <sup>00</sup>Mo, <sup>00</sup>Mo, <sup>00</sup>Mo, <sup>100</sup>Mo,  
<sup>00</sup>Ni, <sup>00</sup>Ni, <sup>00</sup>Ni, <sup>000</sup>Pb, <sup>000</sup>Pb, SS,  
TOS, <sup>176</sup>Yb
- 208 Federal Institute for Geosciences & Nat  
Stilleweg 2  
D-3000 Hannover 51  
West Germany  
<sup>100</sup>Nd, <sup>100</sup>Sm, <sup>00</sup>Sr
- 209 Freie Universitat Berlin  
SFB-181  
Arnimallee 14  
1 Berlin 33,  
W. Germany  
<sup>100</sup>Ag, <sup>100</sup>Cd, <sup>00</sup>Cr, <sup>100</sup>Ge, <sup>112</sup>In,  
<sup>100</sup>Pt, <sup>100</sup>Te, <sup>100</sup>Te, <sup>100</sup>Te, <sup>00</sup>Ti,  
<sup>00</sup>Ti, <sup>000</sup>Ti
- 210 Gesellschaft fur Kernforschung mbH  
Institute fuer Angewandte Reaktor Phys  
Hebersrasse 5  
75 Karlsruhe  
West Germany  
<sup>118</sup>Fa, <sup>1</sup>Li, <sup>100</sup>Se, <sup>208</sup>Pb, <sup>100</sup>Sn, <sup>100</sup>Sn,  
<sup>100</sup>Sn, <sup>00</sup>Sr, <sup>00</sup>Sr, SS, <sup>100</sup>Te, TOS
- 211 Gesellschaft fur Schwermetallenforschung,  
Finanz Abteilung,  
Postfach 541,  
D-6100 Darmstadt,  
West Germany  
<sup>00</sup>Ca, <sup>00</sup>Ca, <sup>00</sup>Ca, <sup>100</sup>Dy, <sup>00</sup>Fe, <sup>00</sup>Mo,  
<sup>00</sup>Mo, <sup>00</sup>Mo, <sup>00</sup>Mo, <sup>00</sup>Mo, <sup>00</sup>Mo, <sup>100</sup>Mo,  
<sup>00</sup>Pb, <sup>100</sup>Sb, <sup>00</sup>Se, TOS
- 212 Giessen, Universitat  
6300 Giessen, Germany  
<sup>00</sup>Zn
- 213 Hahn-Meitner-Institut  
fur Kernforschung Berlin, Sektion Kernph  
Berlin, Germany  
<sup>118</sup>Fa
- 214 Heidelberg, Universitat  
Heidelberg, Germany  
<sup>00</sup>Ni
- 215 Institut fur Kristallographie  
Universitat Munchen  
Theresien Str. 4A  
D-8000 Munchen 2,  
West Germany  
<sup>1</sup>Li
- 216 Institut fuer Anorganische Chemie der U  
Dr. Fritz Heigel, Prof. of Chemistry  
Heiserstr. 1  
8 Muenchen 2, West Germany  
<sup>118</sup>Cd
- 217 Johann Wolfgang Goethe University  
Frankfurt/Main, Germany  
<sup>100</sup>Pt, <sup>100</sup>Pt, TOS
- 218 Karlsruhe, der Universitat  
Engesserstrasse 7  
75 Karlsruhe, West Germany  
<sup>1</sup>Li
- 219 Kernforschungsanlage Julich GmbH  
Postfach 1913  
D-517 Julich, FRG  
West Germany  
<sup>100</sup>Cd, <sup>100</sup>Gd, <sup>100</sup>Sn, TOS
- 220 Köln, Universitat  
Zulpicher Str. 47  
5 Köln 1, Germany  
<sup>100</sup>Lu, <sup>100</sup>Ta
- 221 Max Planck Institut fur Kernphysik  
Saupfercheckweg  
Heidelberg, Germany  
<sup>00</sup>Ni, <sup>00</sup>Ni, <sup>100</sup>Pb, <sup>208</sup>Pb, SS, TOS
- 222 Max Planck Institute fur Chemie  
Saarstrasse 23, Mainz  
West Germany  
<sup>100</sup>Lu
- 223 Rohstoff-Einfuhr GmbH  
Fouaustrasse 61  
4000 Duesseldorf 1, West Germany  
<sup>100</sup>Te
- 224 Sektion Physik  
Der Universitat Munchen  
Technologisches Labor  
8046 Garching -Am Coulombwall 1, West G  
<sup>100</sup>Cd, SS, <sup>00</sup>Zr

225 Technische Universität Clausthal  
Inst. für Theoretische Metallkunde  
3392 Clausthal-Zellerfeld, West Germany  
1081

226 Universität Wuppertal  
FB 9 - Anorg. Chemie  
Gausstr. 20  
D-5800 Wuppertal  
West Germany  
11Cl, 1081

## GREECE

227 Manchester Royal Infirmary  
Department of Medical Physics  
Oxford Road  
Manchester M13 9WL England  
100Cd

## IRELAND

228 University College  
Accounts Office  
Belfield, Dublin 4  
Ireland  
100Nd, 101Sn

## ISRAEL

229 Landseas Corporation  
1212 Avenue of the Americas  
New York, New York 10036  
110Cd, 100Dy, 100Er, 100Ho, 100Mo, 100Mo,  
100Nd, 100Sb, 100Sn, 100Te, 100Yb

## ITALY

230 Electronics and Materials Corporation,  
Room 1003, Tennohashi Coge Bldg.  
No. 32, Shimo-Machi 2-Chome  
Higashi-Ku, Osaka 540  
Japan  
1Li

231 Euratom C.C.R.  
Ispra (Verona), Italy  
110Lu

232 Istituto Nazionale Di Fisica Nucleare  
Laboratori Nazionali Di Legnaro  
Via Roma n. 4 - 35030 Legnaro  
Padova Italy  
110Cd, 110Cd, 110Er, 110Sn

233 Istituto Nazionale di Fisica Nucleare  
Largo E. Fermi 2  
50125 Florence, Italy  
110Se, 110Te

234 Tropical Metabolism Research Unit  
University of the West Indies  
Mona, Kingston 7  
Jamaica, W. I.  
102Zn

## JAPAN

235 Japan Atomic Energy Research Institute  
Tokai Research Establishment  
Tokai-Mura, Naka-Gun, Ibaraki-Ken  
Japan  
110Ba, 110Ba, 110Sb, 110Sn, 55

236 Japan Radioisotope Association  
Hon-Komagome 2 Chome 20  
Bunhyo-Ku  
Tokyo, Japan

107Ag, 108Ag, 108Ca, 108Ca, 108Ca, 110Cd,  
110Ce, 108Cr, 108Cr, 108Cu, 108Cu, 108Dy,  
108Dy, 108Dy, 108Dy, 108Dy, 108Er,  
108Eu, 108Fe, 108Fe, 108Fe, 108Fe, 108Ga,  
108Ga, 108Ga, 108Ga, 108Ga, 108Ga, 108Ga,  
108Hf, 108Hf, 108La, 108Li, 108Li, 108Mg,  
108Mg, 108Mo, 108Mo, 108Mo, 108Mo, 108Mo,  
108Nd, 108Nd, 108Ni, 108Ni, 108Ni, 108Ni,  
108Ni, 108Pb, 108Pb, 108Pb, 108Pb, 108Rb, 108S,  
108S, 108Se, 108Se, 108Se, 108Se, 108Si,  
108Sm, 108Sm, 108Sm, 108Sn, 108Sn,  
108Sn, 108Sn, 108Sn, 108Sn, 108Sn,  
108Sr, 108Sr, 55, 108Te, 108Te, 108Te,  
108Te, 108Te, 108Te, 108Te, 108Te, 108Te,  
108Yb, 108Zn, 108Zn, 108Zn, 108Zn, 108Zr

237 Kansai Electronics Co., Ltd.  
8 Toganochi  
Kitaku, Osaka, Japan

103Cu, 103Cu, 103Fe, 103Fe, 103Fe, 103Mg,  
103Rb, 103S, 55, 103Te, 103Te, 103Zn

238 Sumitomo Corporation of America  
875 N. Michigan Avenue  
Chicago, Illinois 60611  
103Te

## KOREA

239 Yonsei University  
Seoul, Korea  
103Fe

## NETHERLANDS

240 Reactor Centrum Nederland  
Petten N. H., The Netherlands  
108Ni, 108S, 55

241 Vrije Universiteit  
Amsterdam, The Netherlands  
108Hg, 108Sr, 108S

## NORWAY

242 Institutt for Energiteknikk  
P. O. Box 40  
2007 Kjeller, Norway  
100Pt

243 Oslo, Universitetet of  
Blindern, Oslo 3, Norway  
110Ba, 110Er, 110Er, 110Er, 110Er, 110Er,  
110Yb, 110Yb, 110Yb, 110Yb

## SCOTLAND

244 Saint Andrews, University of  
North Haugh  
St. Andrews, Fife, Scotland

$^{100}\text{Mo}$

245 University of Aberdeen  
Department of Child Health  
Foresterhill  
Aberdeen, Scotland AB9 2ZD  
Scotland

$^{76}\text{Se}$ ,  $^{66}\text{Zn}$

## SOUTH AFRICA

246 Daniel F. Young, Inc.  
Caldwell Division  
s/c National Physical Research Laboratory  
17 Battery Place  
New York, New York 10004  
New York

$^{171}\text{Yb}$

247 South African Embassy  
Office of Science & Technology  
Suite 350  
4801 Massachusetts Avenue NW  
Washington, D.C. 20018

$^{113}\text{Cd}$

248 Witwatersrand University  
Johannesburg, South Africa

$^{40}\text{Ca}$

## SWEDEN

249 Naturhistoriska riksmuseet  
Laboratoriet för Isotopgeologi  
Box 50 007, 104, 05 Stockholm, Sweden

$^{137}\text{Sm}$

250 Stockholm, University of  
Vanadisvagen 9  
Stockholm VA, Sweden

$^{119}\text{Sn}$

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

$^{81}\text{Se}$ ,  $^{120}\text{Te}$ ,  $^{122}\text{Te}$ ,  $^{124}\text{Te}$ ,  $^{126}\text{Te}$

252 University of Lund  
Selvegatan 14  
Lund, Sweden  
S-223 62

$^6\text{Li}$

## SWITZERLAND

253 Basel Universitat  
4000 Basel  
Switzerland

$^{132}\text{Cs}$ ,  $^{65}\text{Ga}$ ,  $^{105}\text{In}$ ,  $^{67}\text{Zn}$

254 Radium-Chemie  
A. Zeller and Company  
9053 Teufen / Ar  
Switzerland

$^{65}\text{Ga}$

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

## A. DOMESTIC

Antimony 123	Chromium 050
93	116, 117
Barium 130	Chromium 052
117	11, 140
Barium 135	Chromium 053
42	36
Barium 138	Copper 063
96	3, 10, 21, 23, 55, 59, 61, 93, 111, 120, 126, 130, 133
Boron 010	Copper 065
69	3, 23, 55, 59, 61, 61, 67, 92, 93, 111, 120, 133
Boron 011	Dysprosium 156
10	92
Bromine 079	Dysprosium 158
90	68, 92
Cadmium 110	Dysprosium 160
3, 19	42
Cadmium 112	Dysprosium 161
19, 60, 75, 94, 104	13, 108
Cadmium 114	Dysprosium 162
104, 117, 130	10
Cadmium 116	Dysprosium 163
104, 117	10, 13, 93, 127
Calcium 040	Erbium 166
3, 136, 148	79, 93, 126, 130, 142
Calcium 042	Erbium 167
73, 95, 117, 134	13, 93, 117, 142
Calcium 043	Erbium 168
20, 122	42, 93, 96
Calcium 044	Erbium 170
10, 42, 59, 73, 120, 126, 134, 136, 145	126
Calcium 046	Europlum 151
17, 109	48
Calcium 048	Europlum 153
17, 63, 117, 125	3, 42, 48, 117
Cerium 140	Gadolinium 152
126, 130	117
Cerium 142	Gadolinium 154
42, 113, 130	42
Chlorine 035	Gadolinium 155
5	3, 13



Cadmium 156	3	Lead 207	3, 91, 92, 115, 117
Cadmium 157	3	Lead 208	3, 26, 42, 59, 76, 97, 106, 117, 126, 132, 148
Cadmium 160	88, 117, 144	Lead High Purity 204	126
Gallium 069	8	Lithium 006	3, 6, 10, 12, 22, 41, 43, 45, 67, 72, 73, 89, 101, 102, 105, 106, 110, 111, 117, 137, 141
Gallium 071	92	Lithium 007	3, 4, 12, 31, 43, 45, 46, 58, 73, 99, 107, 117, 131
Germanium 073	91	Lutetium 176	42
Germanium 074	10, 91	Magnesium 024	35, 84, 85, 104
Germanium 076	91	Magnesium 025	29, 42, 59, 120, 130, 134
Hafnium 177	10, 93, 117	Magnesium 026	11
Hafnium 178	79	Mercury 196	40
Hafnium 179	117, 140	Mercury 198	10
Hafnium 180	42, 54, 79, 117, 140	Mercury 199	40
Iron 054	1, 3, 11, 14, 25, 34, 35, 91, 92, 120, 130, 134, 146	Mercury 201	146
Iron 056	29, 80, 93, 117, 120	Mercury 202	40
Iron 057	2, 8, 11, 55, 59, 73, 78, 85, 93, 117, 123, 133, 140	Molybdenum 092	1, 18
Iron 058	47, 49	Molybdenum 095	117, 119, 130, 135
Lanthanum 138	42	Molybdenum 096	18
Lead 204	26, 79	Molybdenum 097	59
Lead 205	42	Molybdenum 098	17
Lead 206	3	Molybdenum 100	16, 17, 18, 42, 59

Neodymium 142  
     110, 126, 139  
 Neodymium 144  
     3, 56, 84, 126  
 Neodymium 145  
     13  
 Neodymium 146  
     3, 17, 139  
 Neodymium 148  
     17  
 Neodymium 150  
     3, 15, 17, 42, 76, 85, 88, 121, 126,  
     139  
 Nickel 058  
     1, 3, 146  
 Nickel 060  
     146  
 Nickel 061  
     39, 146  
 Nickel 062  
     1, 3, 146  
 Nickel 064  
     3, 38, 45, 117, 146  
 Osmium 187  
     82  
 Osmium 189  
     127, 128  
 Osmium 192  
     126  
 Palladium 102  
     104  
 Palladium 105  
     10  
 Palladium 106  
     17, 83, 93, 104  
 Palladium 108  
     10, 17, 93, 117  
 Palladium 110  
     17, 82  
 Platinum 192  
     17  
 Platinum 196  
     10, 51  
 Plutonium 242  
     38  
 Potassium 039  
     100, 140  
 Potassium 041  
     117, 126  
 Rubidium 085  
     44, 53, 92, 100  
 Rubidium 087  
     42, 44, 52, 53, 77, 92, 113, 126, 139  
 Ruthenium 100  
     93  
 Ruthenium 101  
     10, 93  
 Samarium 144  
     3  
 Samarium 147  
     42, 85, 126, 139  
 Samarium 148  
     64, 126, 140  
 Samarium 149  
     76, 122, 139  
 Samarium 150  
     110  
 Samarium 152  
     5  
 Samarium 154  
     79, 88, 126  
 Selenium 074  
     91, 114, 117  
 Selenium 076  
     3, 45, 73, 91  
 Selenium 077  
     32, 91, 103, 135  
 Selenium 078  
     10, 91  
 Selenium 080  
     45, 91  
 Selenium 082  
     24, 72, 91, 99  
 Silicon 028  
     3, 104, 136, 140

Silicon 029		Tellurium 130	
37		27, 70, 89, 104, 117	
Silicon 030		Thallium 203	
7, 59, 88		57, 80, 75, 98, 117, 118	
Silver 107		Tin 112	
21, 83, 133		3, 45, 74, 85, 117	
Silver 109		Tin 114	
133		3	
Special Services		Tin 116	
3, 10, 16, 17, 24, 25, 27, 36, 40, 51, 54, 59, 65, 66, 73, 82, 86, 93, 95, 116, 117, 118, 125, 126, 130, 140, 142, 143, 146		10, 117	
Strontium 084		Tin 117	
52, 100, 117		10	
Strontium 087		Tin 118	
80		117, 129	
Strontium 088		Tin 119	
30, 42, 52, 77, 111, 117, 126, 139, 140		28, 33, 112, 128, 129, 147	
Sulfur 032		Tin 120	
45, 124		3, 59, 126	
Sulfur 033		Tin 122	
59, 95, 117, 123, 135		117	
Sulfur 034		Tin 124	
32, 45, 58, 86, 96, 117, 130		68	
Target Preparation Stable		Titanium 048	
3, 17, 21, 34, 47, 50, 56, 59, 91, 108, 117, 118, 123, 126, 130, 132, 133, 136, 137, 140, 148		11, 65, 117, 126, 140	
Tellurium 120		Titanium 050	
104		126	
Tellurium 122		Tungsten 182	
104		17, 117	
Tellurium 123		Tungsten 183	
70		86	
Tellurium 124		Tungsten 184	
60, 70, 94, 104		10, 59, 86, 117	
Tellurium 125		Tungsten 186	
32, 60		9, 10, 117, 128	
Tellurium 126		Ytterbium 168	
126		117	
Tellurium 128		Ytterbium 170	
70, 117		3, 42	
		Ytterbium 172	
		96	
		Ytterbium 173	
		13	

Ytterbium 174		Cadmium 112	
84, 113, 117, 145		238, 247	
Ytterbium 176		Cadmium 114	
59, 88		183, 209, 218	
Zinc 064		Cadmium 116	
95, 117		224, 229, 232	
Zinc 066		Calcium 040	
59, 70, 120		236	
Zinc 067		Calcium 041	
6, 10, 59, 92, 120, 130		207	
Zinc 068		Calcium 042	
17, 45, 60, 71, 75, 117, 120, 138		152, 177, 191, 211, 236	
Zinc 070		Calcium 044	
17, 117		184, 193, 211, 236	
Zirconium 090		Calcium 046	
117, 142		183	
Zirconium 091		Calcium 048	
142		211, 248	
Zirconium 092		Cerium 136	
17, 66		236	
Zirconium 094		Cerium 140	
42, 66, 142, 143		165, 184	
Zirconium 096		Cerium 142	
3		181, 186	
	B. FOREIGN	Chlorine 035	
		152, 201	
Antimony 121		Chlorine 037	
235		152, 201, 226	
Antimony 123		Chromium 050	
211, 229		169, 184, 200, 209, 236	
Barium 130		Chromium 052	
149		169	
Barium 135		Chromium 053	
188, 235		177, 236	
Barium 138		Copper 063	
149, 235, 243		171, 236, 237	
Cadmium 106		Copper 065	
219, 232		171, 177, 189, 236, 237	
Cadmium 108		Dysprosium 156	
227		236	
Cadmium 111		Dysprosium 160	
163, 177		169, 211, 236	

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236	
Dysprosium 162	
188	
Dysprosium 163	
236	
Dysprosium 164	
188, 204, 229, 236	
Erbium 166	
243	
Erbium 167	
161, 188, 243	
Erbium 168	
204, 229, 236, 243	
Erbium 170	
232	
Europlum 151	
149, 236	
Europlum 153	
158, 161, 180	
Gadolinium 152	
181, 236	
Gadolinium 155	
161, 180, 236	
Gadolinium 158	
180, 194	
Gadolinium 160	
194, 219, 236	
Gadolinium High Purity 155	
186	
Gadolinium High Purity 157	
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150, 236	
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236	
Germanium 074	
209	
Hafnium 178	
236	
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236	
Hafnium 180	
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Indium 113	
188, 209	
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188, 236, 237	
Iron 056	
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Iron 057	
164, 177, 194, 205, 210, 213, 236, 237, 239	
Iron 058	
165, 184, 211, 236	
Lanthanum 138	
161, 184, 188, 191, 197, 236	
Lead 204	
183, 236	
Lead 205	
207	
Lead 206	
163, 177, 204, 236	
Lead 207	
198	
Lead 208	
161, 204, 221, 236, 243	
Lead High Purity 204	
207	
Lead High Purity 207	
211	
Lithium 006	
174, 178, 182, 185, 195, 202, 210, 218, 236, 252	
Lithium 007	
207, 215, 230, 236	
Lutetium 176	
149, 186, 191, 220, 222, 231	
Magnesium 024	
164, 166, 236, 237	
Magnesium 025	
198, 236	
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200	

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     157, 211, 229, 236  
 Molybdenum 094  
     207, 211, 229, 236  
 Molybdenum 095  
     190, 207, 211, 244  
 Molybdenum 096  
     207, 211, 229, 236  
 Molybdenum 097  
     172, 190, 211  
 Molybdenum 098  
     199, 211, 236  
 Molybdenum 100  
     207, 211, 236  
 Neodymium 143  
     161, 199  
 Neodymium 146  
     236  
 Neodymium 150  
     187, 191, 194, 208, 228, 229, 236  
 Nickel 058  
     152, 156, 165, 236  
 Nickel 060  
     152, 156, 162, 207, 221, 236  
 Nickel 061  
     152, 156, 162, 176, 207, 236  
 Nickel 062  
     156, 165, 207, 236, 240  
 Nickel 064  
     168, 214, 221, 236  
 Osmium 192  
     253  
 Palladium 110  
     165  
 Platinum 192  
     209  
 Platinum 195  
     202, 217  
 Platinum 198  
     217, 242  
 Plutonium 242  
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 Samarium 147  
     188, 208, 228, 236, 249  
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     161, 236  
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 Samarium 152  
     194, 236  
 Samarium 154  
     194, 204  
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     193, 245  
 Selenium 076  
     167, 173, 236  
 Selenium 077  
     151, 236  
 Selenium 078  
     149, 173, 210, 233, 236  
 Selenium 082  
     149, 211, 236, 251  
 Silicon 028  
     155, 164, 192, 221, 236  
 Silicon 029  
     153, 156, 194, 226  
 Silicon 030  
     192, 194, 210, 225  
 Silver 107  
     171, 203, 236  
 Silver 109  
     209, 236  
 Special Services  
     149, 152, 156, 164, 165, 168, 177,  
     184, 200, 205, 207, 210, 221, 224,  
     235, 236, 237, 240, 253, 254  
 Strontium 084  
     161, 184

Sirconium 086	Tin 118
210, 236	236
Sirconium 087	Tin 119
210	194, 236
Sirconium 088	Tin 120
188, 183, 184, 191, 197, 208, 236, 241	171, 210, 232, 236, 250
Sulfur 032	Tin 122
237	210, 235
Sulfur 033	Tin 124
236	210, 229
Sulfur 034	Titanium 046
177, 178, 187, 236, 240	209, 236
<i>Target Preparation Stable</i>	Titanium 047
155, 157, 166, 170, 172, 175, 184, 182, 202, 204, 207, 210, 211, 217, 219, 221, 236, 237, 241, 253	171, 209, 236
Tellurium 120	Titanium 048
251	174, 236
Tellurium 122	Tungsten 182
233, 251	236
Tellurium 123	Tungsten 184
220	152, 184
Tellurium 124	Ytterbium 168
157, 168, 210, 223, 236, 238, 251	184
Tellurium 125	Ytterbium 170
236	207
Tellurium 126	Ytterbium 171
188, 209, 236, 251	161, 243, 246
Tellurium 128	Ytterbium 172
157, 194, 209, 237	236, 243
Tellurium 130	Ytterbium 173
166, 188, 209, 229, 236	202, 243
Thallium 203	Ytterbium 174
159, 209	204, 229, 243
Tin 112	Zinc 064
184, 219, 236	236
Tin 114	Zinc 066
160, 236	177, 236, 237
Tin 116	Zinc 067
236	212, 253
Tin 117	Zinc 068
236	159, 165, 236
	Zinc 070
	168, 234, 236, 245

Zirconium 080

194

Zirconium 081

186

Zirconium 082

224, 236

Zirconium 084

194

Zirconium 088

170, 172



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

A. DOMESTIC

Arizona	4, 5	Missouri	57, 68, 139
Arkansas	124	New Hampshire	28, 76, 101
California	11, 12, 13, 14, 15, 16, 17, 44, 48, 53, 60, 94, 100, 104, 113, 119, 125, 147	New Jersey	7, 8, 28, 33, 34, 49, 92, 99, 106, 115
Colorado	22, 23, 50, 97, 121	New Mexico	77, 126
Connecticut	25, 129, 148	New York	2, 6, 10, 21, 24, 32, 78, 79, 95, 96, 118
District of Columbia	72, 123	North Carolina	29, 80
Florida	35, 36, 71	North Dakota	81
Georgia	38, 39	Ohio	41, 47, 62, 69, 70, 84, 85, 86, 112, 128
Hawaii	43	Oklahoma	31
Idaho	30	Oregon	87, 88, 89
Illinois	3, 65, 82, 127, 130	Pennsylvania	18, 90, 91, 142, 143
Indiana	45, 83, 93	South Carolina	37, 103
Iowa	46, 55	Tennessee	107, 108, 117, 118, 136
Kentucky	51	Texas	1, 54, 102, 109, 110, 111, 133, 135
Louisiana	56, 120	Utah	134
Maryland	58, 73, 98, 114	Virginia	122, 137
Massachusetts	9, 20, 27, 40, 42, 52, 59, 75, 105, 131	Washington	66, 74, 138, 140, 144
Michigan	63, 64, 141	Wisconsin	19, 61, 145
Minnesota	67, 132	Wyoming	146

B. FOREIGN

Australia	149, 150, 151, 152, 153, 154	Scotland	244, 245
Austria	155	South Africa	246, 248
Belgium	156, 157, 158	Sweden	249, 250, 251, 252
Brazil	159, 160, 161	Switzerland	253, 254
Canada	162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177	West Germany	207, 208, 211, 215, 216, 219, 224, 226
Chile	178	West Indies	234
China	179		
Denmark	180, 181, 182, 183		
District of Columbia	247		
England	184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 227		
Finland	196		
France	197, 198, 199		
Germany	200, 201, 202, 203, 204, 205, 206, 209, 210, 212, 213, 214, 217, 218, 220, 221, 222, 223, 225		
Ireland	228		
Israel	229		
Italy	231, 232, 233		
Japan	230, 235, 236, 237, 238		
Korea	239		
Netherlands	240, 241		
Norway	242, 243		

ISOTOPE	IV. STABLE ISOTOPE SALES - FY 1983			IV. STABLE ISOTOPE SALES - FY 1983			IV. STABLE ISOTOPE SALES - FY 1983			TOTAL		
	SHIP	DOMESTIC MILLIGRAMS	DOLLARS	SHIP	FOREIGN MILLIGRAMS	DOLLARS	SHIP	PROJECT MILLIGRAMS	DOLLARS	SHIP	MILLIGRAMS	DOLLARS
ANTIMONY-123	1	100.0	140	2	288.0	393				3	388.0	533
BARIUM-130				1	20.0	425				2	50.0	1062
BARIUM-135	1	30.0	118	1	180.0	100	1	30.0	637	2	210.0	218
BARIUM-138	1	1000.0	100	2	340.0	240				3	1340.0	340
BROMINE-79	1	102.0	100							1	102.0	100
CADMIUM-106				2	72.0	1334				2	72.0	1334
CADMIUM-108				1	175.0	140				1	175.0	140
CADMIUM-110								6.0			6.0	
CADMIUM-111				2	93.0	215				2	93.0	215
CADMIUM-112	11	78000.0	39000	2	300.0	200				13	78300.0	39200
CADMIUM-114	3	1450.0	662	4	5350.0	2417	1	200.0	100	8	7000.0	3180
CADMIUM-116	1	100.0	350	3	730.0	2555	2	100.0	350	6	930.0	3255
CALCIUM-41				1	1.0	1199				1	1.0	1199
CALCIUM-40	3	1100.0	750	1	500.0	325	1	1000.0	650	5	2600.0	1725
CALCIUM-42	4	80.0	1339	5	158.0	2644	5	417.0	6979	14	655.0	10963
CALCIUM-43	1	5.0	1455				1	5.0	1455	2	10.0	2911
CALCIUM-44	6	434.0	1577	4	1120.0	4084	4	1825.0	6626	14	3379.0	12288
CALCIUM-46	1	1.5	3020	2	5.0	10068				3	6.5	13088
CALCIUM-48	1	85.0	12567	2	1002.0	238277		8.0	148	3	1095.0	250992
CERIUM-136				1	5.0	181				1	5.0	181
CERIUM-140	3	4950.0	340	3	9000.0	450	1	2000.0	100	7	15950.0	890
CERIUM-142	2	158.4	370	2	95.0	200	1	100.0	180	5	354.4	750
CHLORINE-35	1	500.0	200	2	450.0	200				3	950.0	400
CHLORINE-37				4	250.0	1850				4	250.0	1850
CHROMIUM-50	1	250.0	1337	7	2700.0	14480	1	30.0	160	9	2980.0	15977
CHROMIUM-52	2	450.0	382	1	150.0	127				3	600.0	510
CHROMIUM-53	1	400.0	1000	2	140.0	350				3	540.0	1350
COPPER-63	9	8000.7	1225	4	7332.0	1100	4	12400.0	1390	17	27732.7	3715
COPPER-65	11	4910.3	1485	6	2832.0	850	2	1000.0	300	19	8742.3	2635
DYSPROSIUM-156	1	20.0	363	1	6.0	108				2	26.0	471
DYSPROSIUM-158	3	150.0	1950							3	150.0	1950
DYSPROSIUM-160	1	80.0	112	6	593.0	838				7	673.0	950
DYSPROSIUM-161	3	120.0	200	1	333.0	100				4	453.0	300
DYSPROSIUM-162				1	333.0	100				1	333.0	100
DYSPROSIUM-163	2	350.0	200	3	2285.0	800	1	400.0	160	6	3035.0	1160
DYSPROSIUM-164				5	8790.0	2300				5	8790.0	2300
ERBIUM-166	1	1516.0	303	1	279.0	100	2	520.0	100	4	2315.0	503
ERBIUM-167	1	100.0	100	3	900.0	300		776.0	126	4	1776.0	526
ERBIUM-168	2	700.0	200	4	955.0	412				6	1655.0	612
ERBIUM-170				1	69.0	100	1	350.0	105	2	419.0	205
EUROPIUM-151	1	250.0	100	2	473.0	200				3	723.0	300
EUROPIUM-153	3	472.0	212	3	440.0	300	1	553.0	248	7	1465.0	761
GADOLINIUM-152				3	142.6	2810	2	86.0	1207	5	228.6	4017
GADOLINIUM-154	1	45.0	109							1	45.0	109
GADOLINIUM-155	1	60.0	105	3	190.0	375	1	20.0	100	5	270.0	590
GADOLINIUM-156				1			1	20.0	100	1	20.0	100
GADOLINIUM-157				1			1	25.0	100	1	25.0	100
GADOLINIUM-158				2	410.0	216				2	410.0	216
GADOLINIUM-180	1	500.0	450	3	5650.0	4533	1	112.0	100	5	6262.0	5083
GALLIUM-69	1	750.0	375	2	800.0	400				3	1550.0	775
GALLIUM-71	1	115.0	100	1	200.0	170				2	315.0	270
GERMANIUM-73	1	16.0	102							1	16.0	102
GERMANIUM-74	1	700.0	105	1	2000.0	300	1	300.0	345	3	3000.0	750
GERMANIUM-76	1	11.0	100							1	11.0	100
H.P. 60-155				1	15.0	100				1	15.0	100
H.P. 60-157				1	100.0	335				1	100.0	335

ISOTOPE	DOMESTIC		FOREIGN		PROJECT		TOTAL					
	SHIP	MILLIGRAMS DOLLARS	SHIP	MILLIGRAMS DOLLARS	SHIP	MILLIGRAMS DOLLARS	SHIP	MILLIGRAMS DOLLARS				
H.P. LEAD-204			1	102.0		1244	1	10.0	122	2	112.0	1366
H.P. LEAD-207			1	207.0		382				1	207.0	382
H.P. PU-242	1	25.0	397	10.0		158				2	35.0	556
H.P. SR-84	5	11.0	6920	8.0		5032	2	3.0	1721	12	22.0	13674
HAFNIUM-177							1	86.0	150	1	86.0	150
HAFNIUM-178	1	74.0	100	600.0		810				3	674.0	910
HAFNIUM-179	1	100.0	1	100.0		175	1	60.0	105	3	260.0	280
HAFNIUM-180	4	349.0	336	1246.0		1687	1	75.0	101	11	1670.0	2125
INDIUM-113				60.0		789				2	60.0	789
IRON-54	12	2618.0	4727	1306.0		2350	2	600.0	1080	22	4524.0	8158
IRON-56	3	11700.0	1200	23411.0		2341	1	1000.0	100	10	36111.0	3641
IRON-57	13	1192.0	10612	3506.0		31207	2	518.0	4286	30	5216.0	46106
IRON-58	2	18.5	713	1587.8		59624				1	1606.3	60337
LANTHANUM-138	1	5.0	202	181.0		7321				2	186.0	7523
LEAD-204	2	38.7	282	100.0		730				1	139.7	1012
LEAD-205	1	2.0	1604	1.0		802				1	3.0	2406
LEAD-206				680.0		856	1	500.0	625		1180.0	1481
LEAD-207	4	703.0	675	800.0		760	1	7311.0	2119		8914.0	3554
LEAD-208	8	3212.8	1767	2961.0		1629	4	74603.0	7347		80776.8	10744
LUTETIUM-176	1	13.0	100	469.0		2125					482.0	2225
MAGNESIUM-24	4	1900.0	665	1440.0		690					3340.0	1355
MAGNESIUM-25	6	750.0	1500	650.0		1300		200.0	400	10	1600.0	3200
MAGNESIUM-26	1	300.0	555							1	300.0	555
MERCURY-196	1	10.0	4905	15.0		11052				2	25.0	15957
MERCURY-198				9.3		121				1	9.3	121
MERCURY-199	1	10.0	133							1	10.0	133
MERCURY-201		-244.0	-2297								-244.0	-2297
MERCURY-202	1	10.0	153							1	10.0	153
MOLYBDENUM-992	2	750.0	225	1150.0		415				6	1900.0	640
MOLYBDENUM-994				1540.0		785				5	1540.0	785
MOLYBDENUM-995	3	3523.0	1056	1500.0		460	1	400.0	120	8	5423.0	1636
MOLYBDENUM-996	1	400.0	100	2520.0		750				9	2920.0	850
MOLYBDENUM-997	1	250.0	112	580.3		347				4	830.3	460
MOLYBDENUM-998				480.0		600	1	20.0	100	4	500.0	700
MOLYBDENUM-100	3	800.0	400	1400.0		700	1	20.0	100	9	2220.0	1200
NEODYMIUM-142	2	304.0	562				1	100.0	185	3	404.0	747
NEODYMIUM-143				205.0		200				2	205.0	200
NEODYMIUM-144	3	510.0	220				2	4723.0	1036	5	5233.0	1256
NEODYMIUM-145	1	100.0	100				1			1	100.0	100
NEODYMIUM-146	1	222.0	100	223.0		100	2	3454.0	1258	4	3899.0	1458
NEODYMIUM-148							1	20.0	100	1	20.0	100
NEODYMIUM-150	6	629.4	650	1650.0		1660	5	753.0	1030	19	3032.4	3340
NICKEL-58	1	300.0	105	13105.0		4680	3	7500.0	2102	12	20905.0	6887
NICKEL-60				2740.0		875				9	2740.0	875
NICKEL-61	1	14.0	202	440.0		6350				8	454.0	6552
NICKEL-62	1	30.0	261	8650.0		75255				1	10224.0	79830
NICKEL-64	2	41.7	671	260.0		4091	3	400.0	2208	7	701.7	6970
OSMIUM-187	1	25.0	297							1	25.0	297
OSMIUM-189	2	100.0	250							2	100.0	250
OSMIUM-192				354.0		1362					1238.0	1654
PALLADIUM-102	1	50.0	1185							1	50.0	1185
PALLADIUM-105								21.0	18		21.0	18
PALLADIUM-106	2	239.5	218					20.0	100	3	259.5	318
PALLADIUM-108		16.0	9					165.0	593	3	181.0	602
PALLADIUM-110				50.0		100	1	20.0	100	2	70.0	200
PLATINUM-192				40.0		694	1	20.0	342	2	60.0	1026
PLATINUM-195				22.0		200				2	22.0	200

ISOTOPE	DOMESTIC		FOREIGN		PROJECT		TOTAL		
	SHIP	MILLIGRAMS DOLLARS	SHIP	MILLIGRAMS DOLLARS	SHIP	MILLIGRAMS DOLLARS	SHIP	MILLIGRAMS DOLLARS	
PLATINUM-196						30.0	20	30.0	20
PLATINUM-198			2	100.0	875			100.0	875
POTASSIUM-39	2	1333.0	400					1333.0	400
POTASSIUM-41						119.0	695	119.0	695
RUBIDIUM-85	13	1216.0	435	1	500.0	150		1716.0	585
RUBIDIUM-87	19	1528.0	5380	6	1218.0	4293	2	2886.0	10153
RUTHENIUM-100		24.0	63					24.0	63
RUTHENIUM-101		14.0	19					14.0	19
SAMARIUM-144						20.0	177	20.0	177
SAMARIUM-147	3	395.0	415	5	1196.0	935	1	2591.0	1600
SAMARIUM-148	2	800.0	200			1000.0	250	1135.0	300
SAMARIUM-149	2	106.0	204	2	600.0	200	1	755.0	504
SAMARIUM-150	1	200.0	400	1	500.0	1000		700.0	1400
SAMARIUM-152	1	130.0	149	3	1220.0	1480		1350.0	1629
SAMARIUM-154	2	1036.0	250	2	780.0	800		47291.0	2906
SELENIUM-74	1	3.0	535	2	1.0	200		284.0	48516
SELENIUM-76	2	120.0	696	3	140.0	816	4	3155.0	16452
SELENIUM-77	4	305.0	3363	2	130.0	1436	1	485.0	5352
SELENIUM-78	1	25.0	106	5	270.0	1162	2	745.0	2924
SELENIUM-80	2	298.5	268					298.5	268
SELENIUM-82	2	1461.0	1453	4	55.0	1617	1	1546.0	3952
SILICON-28	3	838.0	727	6	2425.0	2155	2	3753.0	3298
SILICON-29	1	250.0	600	4	1250.0	3000		1500.0	3600
SILICON-30	3	460.0	1840	4	875.0	3300		1335.0	5140
SILVER-107	3	150.0	460	3	2500.0	1000		3650.0	1460
SILVER-109	1	167.0	100	5	2666.0	1600		2833.0	1700
STRONTIUM-84	2	5.0	259	2	140.0	7273	1	185.0	9332
STRONTIUM-86				2	3200.0	1600		3200.0	1600
STRONTIUM-87	1	222.0	100	1	3000.0	1350		3222.0	1450
STRONTIUM-88	1	1000.0	150	4	36800.0	5520	1	38250.0	5770
SULFUR-32	2	800.0	360	1	200.0	100		1000.0	460
SULFUR-33	2	224.0	1676	1	60.0	351	2	357.0	6184
SULFUR-34	5	397.0	1290	6	546.0	1777		943.0	3067
TELLURIUM-120	1	40.0	1796	2	10.0	449		50.0	2245
TELLURIUM-122	1	25.0	453	2	30.0	544		55.0	998
TELLURIUM-123				1	40.0	960	1	90.0	1846
TELLURIUM-124	4	25025.0	258507	10	21110.0	217208	1	46185.0	476230
TELLURIUM-125	3	5375.0	11556	1	100.0	215		5475.0	11771
TELLURIUM-126				4	3532.0	1942	1	3732.0	2052
TELLURIUM-128				4	7500.0	3750	3	9078.0	4600
TELLURIUM-130	2	470.0	212	6	3795.0	1708		5275.0	2471
THALLIUM-203	10	643750.0	1190937	2	554.0	1025		655408.0	1207183
TIN-112	3	154.0	2979	4	2030.0	39280	3	2361.0	44541
TIN-114				2	60.0	903	1	160.0	3860
TIN-116				1	300.0	105	2	1620.0	567
TIN-117				2	680.0	240	1	980.0	345
TIN-118	1	87.0	100	2	200.0	230	2	2487.0	3725
TIN-119	6	3683.0	1105	2	2100.0	700		5783.0	1805
TIN-120	1	250.0	100	6	3366.2	1400		4295.2	1618
TIN-122				1	143.0	100	1	343.0	240
TIN-124	1	4000.0	2200	3	562.0	310		4562.0	2510
TITANIUM-46				3	210.0	310		210.0	310
TITANIUM-47				3	1370.0	1164		1370.0	1164
TITANIUM-48	3	1740.0	522	3	893.0	350	2	3107.0	1091
TITANIUM-50								126.0	154
TUNGSTEN-182				1	500.0	150	3	2300.0	690
TUNGSTEN-184	1	400.0	140	2	586.0	205	1	1386.0	485

ISOTOPE	D O M E S T I C			F O R E I G N			P R O J E C T			T O T A L		
	SHIP	MILLIGRAMS	DOLLARS	SHIP	MILLIGRAMS	DOLLARS	SHIP	MILLIGRAMS	DOLLARS	SHIP	MILLIGRAMS	DOLLARS
TUNGSTEN-186	2	447.0	201				3	600.0	300	5	1047.0	501
YTTERBIUM-168				4	680.0	172599	2	77.0	13048	6	757.0	185647
YTTERBIUM-170	1	25.0	112	1	300.0	1590	1	300.0	990	3	625.0	2692
YTTERBIUM-171				3	310.0	300				3	310.0	300
YTTERBIUM-172	1	250.0	212	2	370.0	314				3	620.0	527
YTTERBIUM-173	1	100.0	100	2	1611.0	988				3	1711.0	1088
YTTERBIUM-174	3	475.0	380	3	330.0	304	2	190.0	220	8	995.0	904
YTTERBIUM-176	2	700.0	630							2	700.0	630
ZINC-64	1	941.0	517	1	100.0	100	2	20.0	100	4	1061.0	717
ZINC-66	1	1500.0	1050	4	938.0	657	2	1409.0	986	7	3847.0	2693
ZINC-67	5	500.0	2620	2	69.0	362	2	1400.0	6443	9	1969.0	9425
ZINC-68	6	72140.0	180350	3	10140.0	25350	4	90.0	325	13	82370.0	206025
ZINC-70				4	145.0	6293	2	40.0	1736	6	185.0	8029
ZIRCONIUM-90				1	500.0	475	3	2500.0	2300	4	3000.0	2775
ZIRCONIUM-91				1	6.0	100	1	10.0	151	2	16.0	251
ZIRCONIUM-92	1	500.0	800	3	360.0	592	1	300.0	510	5	1160.0	1902
ZIRCONIUM-94	2	345.0	1660	1	250.0	1250	1	100.0	500	4	695.0	3410
ZIRCONIUM-96				2	40.0	2634	1	52.0	2564	3	92.0	5198
TOTAL	342	916595.0	1795832	472	260803.2	1063271	157	208095.0	188720	971	1385493.2	3047824

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