

Spreadsheet -Appendix 2 for SEC-00028

Stable and Radioactive Isotopes Produced and/or Separated and Purified at Y-12																	
Isotope	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1961	1963	1965	1967	1968
Aluminum-26m													b				
Aluminum-28																	
Antimony-121										305 mg	112 mg						
Antimony-122										961 mCi	4,735 mCi						
Antimony-123											20 mg						
Antimony-124										21 mCi	207 mCi						
Antimony-125										52,100 mCi	4 mCi						
Antimony-Be									278 mCi								
Argon-37									5 mCi	6 mCi	36 mCi						
Argon-38									11 mCi	9 mCi	6 cc						
Arsenic-74													3 Ci				
Arsenic-76											73 mCi						
Arsenic-77										28 mCi	32 mCi						
Barium-130										20 mg	81 mg						
Barium-131										19 mCi	3 mCi						
Barium-132										10 mg	55 mg						

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Isotope	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1961	1963	1965	1967	1968
Barium-133										5 mCi	23 mCi						
Barium-134											540 mg						
Barium-135										20 mg	50 mg						
Barium-136											50 mg						
Barium-137											50 mg						
Barium-138										50 mg	300 mg						
Barium-140									9 mCi	13 mCi	688 mCi						
Beryllium-7									933 mCi				b				
Bismuth-209													b				
Bismuth-210									7 mCi	982 mCi	92 mCi						
Boron-10										10,260,721 mg	12,589,425 mg						
Boron-11										132,194 mg	313,338 mg						
Boron-13																	
Bromine-79										1 mg	20 mg						
Bromine-82									16 mCi	2 mCi	1,889 mCi						
Cadmium-106											10 mg						
Cadmium-108											59 mg						
Cadmium-109													b				

Stable and Radioactive Isotopes Produced and/or Separated and Purified at Y-12

Isotope	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1961	1963	1965	1967	1968
Cadmium-111										367 mg							
Cadmium-112										40 mg	136 mg						
Cadmium-113										40 mg	41 mg						
Cadmium-114										100 mg	330 mg						
Cadmium-115									147 mCi	233 mCi	9 mCi						
Cadmium-115m									21 mCi	20 mCi	33 mCi						
Cadmium-116										25 mg	100 mg						
Calcium-40										225 mg	1,200 mg						
Calcium-42											235 mg						
Calcium-43										3 mg	63 mg						
Calcium-44							b			65 mg	21 mg						
Calcium-45									8 mCi	38 mCi	2,852 mCi						
Calcium-46										40 mg	3 mg						
Calcium-48										259 mg	20 mg						
Carbon-12										10 mg	10 mg						
Carbon-13											1 mg						
Carbon-14										1,983 mCi							

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Isotope	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1961	1963	1965	1967	1968
Cerium-136											20 mg						
Cerium-138																	
Cerium-140										25 mg	230 mg						
Cerium-141									5,782 mCi	9,313 mCi	88 mCi						
Cerium-142										20 mg	507 mg						
Cerium-144									235 mCi	99 mCi	1686 mCi						
Cesium-132													b				
Cesium-134									1,001 mCi	2,344 mCi	1,562 mCi						
Cesium-136																	
Cesium-137										1,789 mCi			b				
Cesium-138										5 mg							
Chlorine-35										2,650 mg	2,017 mg						
Chlorine-36									2,366 mCi		10 mCi						
Chlorine-37										75 mg	100 mg						
Chromium-49												b					
Chromium-50										4303 mg	527 mg						
Chromium-51									4 mCi	8,475 mCi	7,384 mCi						
Chromium-52										28,062 mg	110 mg						

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Isotope	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1961	1963	1965	1967	1968
Chromium-53										120 mg	40 mg						
Chromium-54										2,929 mg	10 mg						
Cobalt-55																	b
Cobalt-56													b				b
Cobalt-57									7,635 mCi	4,031 mCi	4 mCi		4 Ci				b
Cobalt-58									23 mCi	4 mCi	158 mCi						b
Cobalt-60										55 mCi							
Cobalt-61													b				
Copper-63										1,360 mg	30,110 mg						
Copper-64									2 mCi		16,642 mCi						
Copper-65										185 mg	30,476 mg						
Deuterium-Zr										3,834 mCi	2 mCi						
Dysprosium-156											2 mg						
Dysprosium-157																	
Dysprosium-160										20 mg	167 mg						
Dysprosium-161										2,002 mg	682 mg						
Dysprosium-162										2,000 mg	687 mg						
Dysprosium-163										1,786 mg	762 mg						

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Isotope	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1961	1963	1965	1967	1968
Dysprosium-164											2,264 mg						
Erbium-150													b				
Europium							b										
Europium-145																	b
Europium-149													b		b		
Europium-151										3,540 mg	3,790 mg						
Europium-152/154									7 cc	6.5 cc	33 mCi						
Europium-153										3,415 mg	3,787 mg						
Europium-155										76 mCi	0 mCi						
Fissions Products									22 mCi	11 mCi	999 mCi						
Fluorine-18																	
Gadolinium-149													b				
Gadolinium-152										78 mg	59 mg						
Gadolinium-153													b				
Gadolinium-154										35 mg	510 mg						
Gadolinium-155										896 mg	1,050 mg						
Gadolinium-156										48 mg	1,000 mg						
Gadolinium-157										1,373 mg	1,051 mg						
Gadolinium-158										128 mg	1,155 mg						

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Isotope	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1961	1963	1965	1967	1968
Gadolinium-160										264 mg	1,440 mg						
Gallium-64																	
Gallium-67						75 Ci											
Gallium-69										140 mg	1,203 mg						
Gallium-71										280 mg							
Gallium-72										890 mCi	14 mCi						
Germanium-68													b				
Germanium-70										10,251 mg	360 mg						
Germanium-72										15,487 mg							
Germanium-73										3,224 mg							
Germanium-74										34,586 mg	1,830 mg						
Germanium-76										5,049 mg							
Gold-195													b				
Gold-198										10 mCi	175,654 mCi						
Gold-199									305 mCi	36,091 mCi	60 mCi						
Hafnium-174										17 mg	29 mg						
Hafnium-176										15 mg	60 mg						
Hafnium-177										858 mg							

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Isotope	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1961	1963	1965	1967	1968
Hafnium-178										20 mg	35 mg						
Hafnium-179										889 mg	76 mg						
Hafnium-180										150 mg	102 mg						
Hafnium-181										29 mCi	268 mCi						
Helium-3										97 mCi							
Holmium							b										
Hydrogen-3									5,195 cc								
Indium-113										742 mg							
Indium-114											101 mCi						
Iodine-124													b				
Iodine-125									65 mCi				b				
Iodine-127																b	
Iodine-129									13.5 mCi	90 mCi						b	
Iodine-130									4 mg				b				
Iodine-131									50.8 mCi	10.4 mg						b	
Iridium-190														b			
Iridium-191										12 mg	5 mg						
Iridium-193										10 mg	250 mg						

Stable and Radioactive Isotopes Produced and/or Separated and Purified at Y-12

Isotope	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1961	1963	1965	1967	1968
Iron-52												b					
Iron-54										2,873 mg	525 mg						
Iron-55									60 mCi	33 mCi	111 mCi		b				
Iron-55/59											79 mCi						
Iron-56										3,859 mg	3,026 mg						
Iron-57										25 mg	2,953 mg						
Iron-58										329 mg	675 mg						
Iron-59									589 mCi	146 mCi	820 mCi						
Lanthanum-139																	b
Lanthanum-140											131 mCi						
Lead-204										5 mg	135 mg						
Lead-206										406 mg	50 mg						
Lead-207										330 mg	905 mg						
Lead-208										1,350 mg	236 mg						
Lead-209						1.45 Ci											
Lithium-6									6,300 mg	1,292,922 mg	4,768,458 mg						
Lithium-7										58,118 mg	4,585,329 mg						
Lutetium-174													b				

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Isotope	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1961	1963	1965	1967	1968
Magnesium-24										746 mg	250 mg			b			
Magnesium-25									50 mg	1,103 mg	381 mg						
Magnesium-26										495 mg							
Magnesium-27																	
Manganese-51												b					
Manganese-52												b	b				
Manganese-52m												b					
Manganese-54										411 mCi							
Manganese-57																	
Mercury-197										6 mCi	20 mCi						
Mercury-198											35 mg						
Mercury-199										2 mg	10 mg						
Mercury-200											45 mg						
Mercury-201										7 mg	15 mg						
Mercury-202										58 mg	94 mg						
Mercury-203									22 mCi		878 mCi						
Mercury-204										27 mg	40 mg						
Molybdenum-92										20 mg	260 mg						

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Isotope	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1961	1963	1965	1967	1968
Molybdenum-94										14 mg	40 mg						
Molybdenum-95										30 mg	2,920 mg						
Molybdenum-96										20 mg	5 mg						
Molybdenum-97										10 mg	10 mg						
Molybdenum-98										35 mg	50 mg						
Molybdenum-100										210 mg							
Neodymium-142											5,300 mg						
Neodymium-143										3,859 mg	3,260 mg						
Neodymium-144										200 mg	5,200 mg						
Neodymium-145										1,354 mg	2,810 mg						
Neodymium-146										290 mg	5,075 mg						
Neodymium-147										248 mCi	8 mCi						
Neodymium-148										40 mg	53 mg						
Neodymium-150										60 mg	117 mg						
Nickel-58										4,550 mg	1,255 g						
Nickel-60										8,117 mg	190 mg						
Nickel-61										72 mg	20 mg						

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Isotope	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1961	1963	1965	1967	1968
Nickel-62										2,575 mg	100 mg						
Nickel-63									3 mCi	7 mCi	90 mCi						
Nickel-64										210 mg	60 mg						
Niobium-92														b			
Niobium-93																	b
Niobium-94																	b
Niobium-95									76 mCi	77 mCi	56 mCi						
Nitrogen-13																	
Nitrogen-15											13,843 mg						
Osmium-190														b			
Osmium-191									47 mCi	55 mCi	43 mCi						
Palladium-102											10 mg						
Palladium-103													b				
Palladium-104										30 mg							
Palladium-105										30 mg							
Palladium-106										30 mg							
Palladium-108										15 mg	10 mg						
Palladium-109										2 mCi	190 mCi						
Palladium-110										20	75						

Stable and Radioactive Isotopes Produced and/or Separated and Purified at Y-12

Isotope	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1961	1963	1965	1967	1968
										mg	mg						
Phosphorus-32										120 mCi							
Platinum-185													b				
Platinum-190											11 mg						
Platinum-192										3 mg	12 mg						
Platinum-194										6,016 mg	40 mg						
Platinum-195										25 mg							
Platinum-196										60 mg	155 mg						
Platinum-198										10 mg	5 mg						
Plutonium (feed)											110 g						
Plutonium-240									1,110 mCi		4.4 g						
Plutonium-241											0.9 g						
Plutonium-242											0.107 g						
Polonium-207																	
Polonium-208					2.6 g												
Polonium-209													b				
Polonium-211																	b
Potassium-38m												b					
Potassium-39										4,120	1,787						

Stable and Radioactive Isotopes Produced and/or Separated and Purified at Y-12

Isotope	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1961	1963	1965	1967	1968
										mg	mg						
Potassium-40										2 mg	19 mg						
Potassium-41									30 mg	1,720 mg	201 mg	b					
Potassium-42											8,333 mCi						
Potassium-44								0.5 g									
Praseodymium-142									302 mCi	2,757 mCi							
Praseodymium-143										12 mCi	10 mCi						
Promethium-147									1 mCi	8 mCi							
Promethium-148													b				
Radium-219																	b
Rhenium-185										55 mg	1,220 mg						
Rhenium-186											61 mCi						
Rhenium-187										40 mg	75 mg						
Rubidium-74													b				
Rubidium-85										5,708 mg	200 mg						
Rubidium-86											1,978 mCi						
Rubidium-87										3,864 mg	265 mg						
Ruthenium-96											36 mg						

Stable and Radioactive Isotopes Produced and/or Separated and Purified at Y-12

Isotope	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1961	1963	1965	1967	1968
Ruthenium-98										3 mg	12 mg						
Ruthenium-99									75 mg	9 mg	126 mg						
Ruthenium-100										9 mg	81 mg						
Ruthenium-101									150 mg	9 mg	116 mg						
Ruthenium-102									5 mg	215 mg	30 mg						
Ruthenium-103									628 mCi	2,190 mCi	44 mCi						
Ruthenium-104									75 mg	54 mg	41 mg						
Ruthenium-106									209 mCi	74 mCi	420 mCi						
Samarium-144										150 mg	585 mg						
Samarium-145															b		
Samarium-147										285 mg	1,180 mg						
Samarium-148											1,180 mg						
Samarium-149										1,495 mg	1,060 mg				b		
Samarium-150										285 mg	1,000 mg						
Samarium-152										550 mg	1,150 mg						
Samarium-153									717 mCi	330 mCi	136 mCi						
Samarium-154										294 mg	2,407 mg						
Scandium-40																	

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Isotope	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1961	1963	1965	1967	1968
Scandium-43												b					
Scandium-44												b					
Scandium-44m												b	b				
Scandium-46										114 mCi	80,350 mCi						
Selenium-74										110 mg	14 mg						
Selenium-75									167 mCi		333 mCi						
Selenium-76											56 mg						
Selenium-77										60 mg	110 mg						
Selenium-78											100 mg						
Selenium-80										55 mg	200 mg						
Selenium-82										80 mg	310 mg						
Silicon-28										5,310 mg	40 mg			b			
Silicon-29										30 mg	559 mg						
Silicon-30									50 mg		30 mg						
Silver-107										830 mg	100 mg						
Silver-109										1,050 mg	2,200 mg						
Silver-110									420 mCi	421 mCi	273 mCi						
Silver-111									672 mCi	368 mCi	100 mCi						

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Isotope	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1961	1963	1965	1967	1968
Sodium-22													b				
Sodium-24									59 mCi	31 mCi	2,602 mCi						
Strontium-84										12 mg	151 mg						
Strontium-85									1,676 mCi				b				
Strontium-86										2,826 mg	765 mg						
Strontium-87										1,790 mg	1,000 mg						
Strontium-88										4,016 mg	210 mg						
Strontium-89									12 mCi	1,474 mCi	1,439 mCi						
Sulfur-32										220 mg	50 mg						
Sulfur-33										45 mg	8 mg						
Sulfur-34										6 mg	135 mg						
Sulfur-35									1,924 mCi	1,250 mCi							
Technicium-99									75 mCi	161 mCi	82 mCi						
Tellurium-120											1 mg						
Tellurium-122										4 mg	100 mg						
Tellurium-123											100 mg						
Tellurium-123m											115 mg						
Tellurium-124											300						

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Isotope	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1961	1963	1965	1967	1968
											mg						
Tellurium-125										3,200 mg	430 mg						
Tellurium-126										50 mg	430 mg						
Tellurium-128											115 mg						
Tellurium-130										1,050 mg	300 mg						
Thallium-203											1,007 mg						
Thallium-204									1 mCi	0.37 mCi	0 mCi						
Thallium-205											1,014 mg						
Thorium-223																	b
Thorium-230						150 g					259 mCi						
Thorium-nat											0.1966 g						
Thulium-168							b						b				
Tin-112										3 mg							
Tin-113									1,712 mCi	251 mCi	3,000 g						
Tin-114											5 mg						
Tin-115										508 mg	5 mg						
Tin-116										1,714 mg	165 mg						
Tin-117										1,080 mg	165 mg						

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Isotope	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1961	1963	1965	1967	1968
Tin-118										1,790 mg	120 mg						
Tin-119											170 mg						
Tin-120										837 mg	234 mg						
Tin-122										150 mg	20 mg						
Tin-124										150 mg	25 mg						
Titanium-44													b				
Titanium-45												b					
Titanium-46										4,763 mg	90 mg						
Titanium-47										5,576 mg	25 mg						
Titanium-48										53,655 mg	1,050 mg						
Titanium-49										4,178 mg	2,912 mg						
Titanium-50										4,086 mg	20 mg						
Tungsten-180										18 mg	13 mg						
Tungsten-181													b				
Tungsten-182										8,500 mg	499 mg						
Tungsten-183										3,546 mg	2,079 mg						
Tungsten-184										186 mg	530 mg						
Tungsten-185									118 mCi	26 mCi	29 mCi						

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Isotope	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1961	1963	1965	1967	1968
Tungsten-186										7,185 mg	650 mg						
Tungsten-187									0 mCi	95 mCi	79 mCi						
Turbium							b										
Uranium (feed)					4.265 Ci												
Uranium-227																	b
Uranium-234			18 g per run	100 g per run	13,600 g	4,945 Ci					5 mCi						
Uranium-235					10 mg						2,308 g						
Uranium-236					10.7 mg	50 mg					129.5143 g						
Uranium-238					1.8 g	352 mg					0.4798 g						
Vanadium-47												b					
Vanadium-48												b	b				
Vanadium-50										100 mg	2 mg						
Vanadium-51										100 mg							
Yttrium-87													b				
Yttrium-88													b				
Yttrium-90									126 mCi	35 mCi	2,288.294 g						
Yttrium-91									0 mCi	40 mCi	279 mCi						
Zinc-63						2 g											
Zinc-64										351	328						

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Isotope	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1961	1963	1965	1967	1968
										mg	mg						
Zinc-65									250 mCi	940 mCi	1,068 mCi						
Zinc-66										4,993 mg	31 mg						
Zinc-67										135 mg							
Zinc-68										2,917 mg	151 mg						
Zinc-70										103 mg	25 mg						
Zinc-72													b				
Zirconium-89														b			
Zirconium-90										10,046 mg	4,783 mg				b		
Zirconium-91										3,040 mg	150 mg						
Zirconium-92										4,722 mg							
Zirconium-94										4,313 mg							
Zirconium-95											1,455 mCi						
Zirconium-96										122 mg	22 mg						

Notes:

Yellow Cell with no entry indicates the presence of the radioisotope.

Yellow Cell with a "b" indicates that the isotope was used in Atomic Cross Sectional Studies.

Blue cell indicates stable isotopes.