ORNL-TM-4435

RADIOISOTOPE DISTRIBUTION PROGRAM PROGRESS REPORT FOR NOVEMBER 1973

J. H. Gillette

OAK RIDGE NATIONAL LABORATORY
OPERATED BY UNION CARBIDE CORPORATION • FOR THE U.S. ATOMIC ENERGY COMMISSION

ORNL-TM-4435

Contract No. W-7405-eng-26

ISOTOPES DEVELOPMENT CENTER

RADIOISOTOPE DISTRIBUTION PROGRAM PROGRESS REPORT FOR NOVEMBER 1973

J. H. Gillette

Work Sponsored by
AEC Division of Biomedical and
Environmental Research

DECEMBER 1973

OAK RIDGE NATIONAL LABORATORY
Oak Ridge, Tennessee 37830
operated by
UNION CARBIDE CORPORATION
for the
U.S. ATOMIC ENERGY COMMISSION

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RADIOISOTOPE PRODUCTION AND MATERIALS DEVELOPMENT

REACTOR-PRODUCED RADIOISOTOPES

Reactor Products Pilot Production *(R. W. Schaich)*
(Production and Inventory Accounts)

Processed Units	
Radioisotope	Amount (mCi)
Calcium-47	34
Copper-67	19
Zinc-69m	470

ACCELERATOR-PRODUCED ISOTOPES

Cyclotron Products Pilot Production *(M. R. Skidmore)*
(Production and Inventory Accounts)

November 1973 ORNL 86-Inch Cyclotron runs for ORNL and non-ORNL programs are given in Table 1.

Table 1. Cyclotron Irradiations and Runs for November 1973

Date	Customer	Product	Target	Total Time (hr:min)	Total Charges
		ORNL Programs			
10-26-73	Oak Ridge Associated Universities	Gallium-67	Zinc-68	8:50	$ 846
10-26-73	Isotopes Division	Technetium	Molybdenum	2:05	205
10-29-73	Metals & Ceramics Division	Septum Tube			200
11-9-73	Oak Ridge Associated Universities	Gallium-67	Zinc-68	9:00	862
11-21-73	Oak Ridge Associated Universities	Gallium-67	Zinc-68	9:50	941
				29:45	$3054
		Non-ORNL Programs			
11-15-73	New England Nuclear Corporation	Cobalt-57	Nickel-58	51:15	$8525

FISSION PRODUCTS

Krypton-85 Enrichment *(L. L. Leavell)*

Heater su-assembly fabrication is complete. Leak test of subassemblies is in progress. There is no appreciable change in other of the project activities.

Cesium-137 Pilot Production *(R. W. Schaich)*
(Production and Inventory Accounts)

1. Process Status

The ^{137}Cs process equipment is in standby condition.

2. Operational Summary

Product Inventory

Inventory Material	Amount (Ci)
Cesium-137 chloride products	550,544
Sources in fabrication	0
Completed sources	14,015[a]
Total Inventory Material	564,559
Non-Inventory Material	
Material returned or stored for customer	
Puerto Rico sources	8,760
Lockheed	29,050
AECL powder	86,360
Radiation Resources	37,450
Total Non-Inventory Material	161,620
TOTAL INVENTORY AND NON-INVENTORY MATERIAL	726,179

[a]Includes 6400 Ci unclaimed sources.

Fabrication Summary

	November 1973		CY 1973		FY 1974	
	No.	Ci	No.	Ci	No.	Ci
Sources						
Fabricated	0	0	35	44,955	25	22,155
Shipped	0	0	28	37,341	18	14,541
Special Form Cans						
Fabricated	0	0	45	26,000	2	800
Shipped	0	0	42	23,900	2	800

3. Current Orders

Current orders for ^{137}Cs as sources or bulk powder are as follows:

Customer	Amount (Ci)	Estimated Shipping Date
J. L. Shepherd	7,614	a
3M Company	300	b
Isomedix Corporation	108,000	c

[a]Holding for receipt of customer's container.
[b]Holding for request for shipment.
[c]To be scheduled upon receipt of final details.

Strontium-90 Pilot Production *(R. W. Schaich)* (Production and Inventory Accounts)

1. Process Status

The decontamination of the ^{90}Sr powder handling cell proceeded on schedule and no major problems were encountered. The FPDL operated on a three-shift basis to concentrate the work force on this particular project. Replacement of the cell window inner pane and electrical outlets should be completed by December 31, 1973. During the period of in-cell maintenance work, the FPDL crews will decontaminate the vacuum hot press in Cell 10E for transfer to the ^{90}Sr powder handling cell. This equipment will be used to calcine all ^{90}Sr material presently in inventory and to fabricate pellets for the Teledyne Isotopes heat sources. Strontium-90 processing should commence the latter part of January 1974.

Product Inventory

Inventory Material	Amount (Ci)
Feed solution (±25%)[a]	690,800
^{90}Sr titanate products (±10%)	87,200
"AGN" liners	145,500
SNAP-7F sources	115,200
RCA source	62,400
^{90}Sr silicate powder	30,500
Recovery material	25,400
Stock powder cans	6,200
Total	1,163,200
Less SNAP material purchase[b]	277,400
Total Inventory Material	885,800

[a]Includes 200,000 Ci having power density sufficiently high for heat sources.
[b]Strontium-90 purchased under DRRD program and retained in solution form.

Non-Inventory Material	Amount (Ci)
Quehanna recovery material	47,800
Weather Bureau source	12,700
SNAP-7B	173,800
SNAP-7C	27,300
SNAP-7D	159,000
URIPS (billed at 221,000 Ci)	216,000
SNAP material purchase	277,400
Total Non-Inventory Material	914,000
TOTAL INVENTORY AND NON-INVENTORY MATERIAL	1,799,800

Fabrication Summary

	November 1973		CY 1973		FY 1974	
	No.	Ci	No.	Ci	No.	Ci
Sources						
Fabricated	0	0	1	45,700	1	45,700
Shipped	0	0	1	45,700	1	45,700
Special Form Cans						
Fabricated	0	0	71	1,700	0	0
Shipped	1	500	73	2,200	1	500

3. Current Orders

Customer	Amount (Ci)	Estimated Shipping Date
U. S. Navy	221,000	a
New England Nuclear Corporation	9	a
Teledyne Isotopes	155,000	March 1974

[a]All items are complete and awaiting receipt of further shipping instructions.

Short-Lived Fission Production *(R. W. Schaich)*
(Production and Inventory Accounts)

Isotope	Number of Batches	Amount (Ci)
Xenon-133	2	700
Iodine-131	1	48

Promethium-147 Shipments and Current Orders

Donald W. Douglas Laboratories has ordered 50,000 Ci of ^{147}Pm to be shipped December 1973 from Richland, Washington; 3M Company has ordered 5,900 Ci of ^{147}Pm.

RADIOISOTOPE SALES

J. E. Ratledge

A request for quotation was received fron Centre d'Etude de Energie Nucleaire, Mol, Belgium, for 5000 Ci of ^{85}Kr in 1973; 10,000 Ci in 1975 to 1979; and 50,000 Ci in 1980. Requests for quotations were also received from Radiochemical Centre for ^{90}Sr and ^{137}Cs in the Hanford Waste Encapsulation Storage Facility cans. An order was received from 3M Company for 5,900 Ci of ^{147}Pm as oxide.

Shipments made during the month that may be of interest are listed below:

Customer	Isotope	Amount
Large Quantities		
Minnesota Mining & Manufacturing Company	Strontium-90	500 Ci
LASL	Cobalt-60	150 Ci
Sandia Corporation	Cobalt-60	100 Ci
U. S. Radium Corporation	Tritium	10,000 Ci
New England Nuclear Corporation	Tritium	4,000 Ci
Withdrawn Items		
Mayo Clinic	Copper-67	13 mCi
University of Rochester	Iodine-131	300 mCi
University of Pittsburgh	Iodine-131	50 mCi
Items Used in Cooperative Programs		
Oak Ridge Associated Universities	Gold-199	50 mCi
Oak Ridge Associated Universities	Potassium-43	0.5 mCi
Oak Ridge Associated Universities	Gallium-67	780 mCi
Oak Ridge Associated Universities	Bismuth-206	10 mCi
University of California, Los Angeles	Gadolinium-153	12 Ci
National Institutes of Health	Potassium-43	25 mCi
University of Southern California	Platinum-195m	9 mCi
ORNL, Biology Division	Chromium-51	25 mCi
Unusual Items		
Technischen Universitat Munchen, Germany	Tungsten-180	a
Argonne National Laboratory	$^{152}Sm_2O_3$	a

[a]Service irradiation.

The radioisotope sales proceeds and shipments for the first four months of FY 1973 and FY 1974 are given in Table 2.

Table 2. Radioisotope Sales and Shipments

Item	7-1-72 thru 10-31-72	7-1-73 thru 10-31-73
Inventory items	$115,055	$142,307
Major products	18,588	36,060
Radioisotope services	44,172	68,795
Cyclotron irradiations	29,091	26,792
Miscellaneous processed material	19,325	19,919
Packing and shipping	21,985	21,812
Total	$248,216	$315,685
Number of Shipments	685	654

PUBLICATIONS

JOURNALS

J. B. Ball, J. J. Pinajian, J. S. Larsen, and A. C. Rester, "Study of ^{82}Sr, ^{84}Sr, and ^{86}Sr with the (p,t) Reaction," *Phys. Rev.* C8(4), 1438-47 (October 1973).

REPORTS

J. H. Gillette, *Radioisotope Program Progress Report for October 1973*, ORNL-TM-4415, Oak Ridge National Laboratory.

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