ORNL-TM-4502

RADIOISOTOPE DISTRIBUTION PROGRAM PROGRESS REPORT FOR JANUARY 1974

J. H. Gillette

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

ORNL-TM-4502

Contract No. W-7405-eng-26

ISOTOPES DEVELOPMENT CENTER

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Work Sponsored by
AEC Division of Biomedical and
Environmental Research

FEBRUARY 1974

OAK RIDGE NATIONAL LABORATORY
Oak Ridge, Tennessee 37830
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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	18.56
Copper-67	51.16
Technecium-99	28.7 (g)
Zinc-69m	223.2

ACCELERATOR-PRODUCED ISOTOPES

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

January 1974 ORNL 86-Inch Cyclotron runs for ORNL and non-ORNL programs are given in Table 1.

Table 1. Cyclotron Irradiations and Runs for January 1974

Date	Customer	Product	Target	Total Time (hr:min)	Total Charges
		ORNL Programs			
12-21-73	Isotopes Division	Promethium-146	Neodymium-146	17:00	$1647
1-3-74	ORAU	Gallium-67	Zinc-68	9:15	886
1-18-74	ORAU	Gallium-67	Zinc-68	8:55	854
				35:10	$3387
		Non-ORNL Programs			
1-5-74	ICN, Chemical and Radioisotope Division	Yttrium-88	Strontium	9:15	$1380
1-11-74	New England Nuclear Corporation	Cobalt-57	Nickel-58	51:15	7314
				60:30	$8694
		Sales Department Inventory			
10-9-73	Isotopes Sales	Cobalt-57	Nickel	16:15	$2275

FISSION PRODUCTS

Krypton-85 Enrichment *(R. J. Lauer)*

The thermal diffusion columns are being assembled. The chilled water equipment has been received and is being stored on the plant site. The Instrumentation and Controls Division is fabricating the detector assemblies, which are expected to be ready for installation on schedule.

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

	January 1974		CY 1974		FY 1974	
	No.	Ci	No.	Ci	No.	Ci
Sources						
Fabricated	0	0	0	0	25	22,155
Shipped	0	0	0	0	18	14,541
Special Form Cans						
Fabricated	0	0	0	0	2	800
Shipped	0	0	0	0	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	204,000	March 1974

[a]Holding for receipt of the customer's container.
[b]Holding for request for shipment.

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

1. Process Status

The maintenance work in the ^{90}Sr powder handling cell proceeded on schedule and the processing of fresh feed was in progress at the end of January 1974. A spare vacuum hot press has been installed in the ^{90}Sr powder handling cell and will be operational in February 1974. This unit will be used initially to fabricate six hot-pressed pellets for Teledyne Isotopes. After the source fabrication is completed, the hot press will be used for the calcination and sintering of all the ^{90}Sr feed at the FPDL. The ^{90}Sr solution will be converted to distrontium titanate, sintered, doubly encapsulated in stainless steel, and stored in the Graphite Reactor Canal.

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

	January 1974		CY 1974		FY 1974	
Sources	No.	Ci	No.	Ci	No.	Ci
Fabricated	0	0	0	0	1	45,700
Shipped	0	0	0	0	1	45,700
Special Form Cans						
Fabricated	0	0	0	0	0	0
Shipped	0	0	0	0	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	39
Strontium-89	1	34
Barium/Lanthanum-140	1	130

RADIOISOTOPE SALES

J. E. Ratledge

A letter was received from Leybold-Heraeus GmbH and Company requesting availability, specifications, specific activity, and void space in WESF cans for 500,000-1,000,000 Ci of ^{137}Cs. An order was received from Radiochemical Centre, England, for 20 kCi of ^{137}Cs as bulk CsCl powder. Isomedix Corporation increased their order of ^{137}Cs from 96,000 Ci to ∿204,000 Ci. We presently have a back log of ^{85}Kr orders totaling 987 Ci.

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

Customer	Isotope	Amount
Large Quantities		
New England Nuclear Corporation	Tritium	8,000 Ci
Minnesota Mining and Mfg. Company	Promethium-147	5,895 Ci
Withdrawn Items		
National Institutes of Health	Copper-67	10 mCi
Mayo Clinic	Copper-67	20 mCi
University of Arizona	Copper-67	10 mCi
University of California	Iodine-131	30 mCi
University of Pittsburgh	Iodine-131	50 mCi
University of Rochester	Iodine-131	300 mCi
Cleveland Metropolitan General Hospital	Iodine-131	50 mCi
Items Used in Cooperative Programs		
Oak Ridge Associated Universities	Gallium-67	520 mCi
University of Southern California	Platinum-195m	10 mCi

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

Table 2. Radioisotope Sales and Shipments

Item	7-1-72 thru 12-31-72	7-1-73 thru 12-31-73
Inventory items	$200,635	$200,250
Major products	28,341	43,425
Radioisotope services	87,763	98,387
Cyclotron irradiations	49,149	37,950
Miscellaneous processed material	26,013	27,063
Packing and shipping	33,770	34,522
Total	$425,671	$441,597
Number of Shipments	1,036	935

PUBLICATIONS

REPORTS

J. H. Gillette, *Radioisotope Program Progress Report for December 1973*, ORNL-TM-4457, Oak Ridge National Laboratory.

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