ORNL/TM-5537

Radioisotope Distribution Program Progress Report for April 1976

E. Lamb

OAK RIDGE NATIONAL LABORATORY
OPERATED BY UNION CARBIDE CORPORATION FOR THE ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION

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OPERATIONS DIVISION

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Work Sponsored by
ERDA Division of Biomedical and
Environmental Research

JULY 1976

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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	20

ACCELERATOR-PRODUCED ISOTOPES

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

April 1976 ORNL 86-Inch Cyclotron runs for ORNL and non-ORNL programs are given in Table 1.

Table 1. Cyclotron Irradiations and Runs for April 1976

Date	Customer	Product	Target	Total Time (hr:min)	Total Charges
		ORNL Programs			
4- 5-76	ORAU	Carbon-11	Boron Oxide	5:15	$ 642
4-13-76	ORAU	Carbon-11	Boron Oxide	5:15	642
4-19-76	ORAU	Carbon-11	Boron Oxide	5:15	642
				15:45	$ 1,926
		Non-ORNL Programs			
4- 2-76	New England Nuclear	Cobalt-57	Nickel-58	51:15	$ 9,031
4-17-76	New England Nuclear	Gallium-67	Zinc-68	8:15	1,440
4-23-76	International Chemical & Nuclear	Cobalt-57	Nickel-58	49:15	9,631
				108:45	$20,102
		Isotopes Sales Inventory			
4- 9-76	Isotopes Sales	Cobalt-57	Nickel	57:15	$ 9,447
4-15-76	Isotopes Sales	Bismuth-207	Lead	9:15	1,733
				66:30	$11,180

Cyclotron Operations

Operations were smooth this month. A teflon insulator on the flat plate dolly, which had shorted due to radiation damage, was replaced. The filament in the ion source was replaced; filament had operated 219 hours.

FISSION PRODUCTS

Krypton-85 Enrichment Facility *(F. N. Case)*

Transfer of the enriched ^{85}Kr product was begun on April 2, 1976 from column AB. Three transfers were successfully made. During the fourth transfer a release of enriched krypton occurred allowing ∿30 curies of 7.5% ^{85}Kr to escape from a rubber tubing to copper tubing connection. All unloading operations have ceased until investigation of cause and making of equipment modifications to prevent the occurrence and reduce the possibility of personnel exposure are complete. No transfers of material have been made since that date.

On April 17, 1976 the columns shut down automatically due to an over-temperature. Investigation showed that a flexible conduit containing power lines to the compressors in the chilled water system wore through a copper refrigerant line due to vibration of the compressor system. The loss of refrigerant resulted in automatic compressor shutdown and a subsequent rise in column temperature. The system was repaired and put back in service on April 21, 1976.

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

1. Process Status

The analytical data on the purified powder batches is not complete. Resampling of the last four batches may be required to quantify the total ^{137}Cs recovered. The cesium analysis of the first batch showed 50% ^{133}Cs, 14% ^{135}Cs, and 36% ^{137}Cs.

2. Operational Summary

Product Inventory

(Decay calculated through April 30, 1975)

Inventory Material	Amount (Ci)
In-Process	0
Cesium-137 chloride powder	32,700
Special form cans and Fabricated Sources	9,900
Total Inventory Material	42,600

Non-Inventory Material	Amount (Ci)
Material returned or stored for customer	
Puerto Rico sources	8,200
Lockheed	20,300
AECL powder	73,800
Radiation Resources	34,600
Minn. Mining & Mfg. Company	9,500
Gamma Industries	8,600
J. L. Shepherd	13,400
Total Non-Inventory Material	168,400
TOTAL INVENTORY AND NON-INVENTORY MATERIAL	211,000

Fabrication Summary

	April 1976		CY 1976		FY 1976	
	No.	Ci	No.	Ci	No.	Ci
Sources						
Fabricated	0	0	2	3,000	28	26,232
Shipped	0	0	2	3,000	18	24,032
Special Form Cans						
Fabricated	0	0	42	4,200	80	9,100
Shipped	0	0	2	200	35	7,322

3. Current Orders

All orders on hand have been completed and the material placed into storage awaiting receipt of release for the material.

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

1. Process Status

The ^{90}Sr process and manipulator cells are being decontaminated under the ERDA Decommissioning Program. The ^{90}Sr powder was removed from the FPDL, encapsulated, and stored for future orders.

Product Inventory

(Decay calculated through April 30, 1975)

Inventory Material	Amount (Ci)
^{90}Sr titanate powder (±5%)	476,000
Sources in fabrication	0
RCA source	57,800
^{90}Sr silicate powder	28,200
Stock powder cans	4,100
Total Inventory Material	566,100

Non-Inventory Material	Amount (Ci)
FPDL recovery material	18,200
Quehanna recovery material	44,400
Weather Bureau source	11,800
SNAP-7B	161,500
SNAP-7C	25,400
SNAP-7D	147,800
SNAP material purchase[a]	256,600
Total Non-Inventory Material	665,700
TOTAL INVENTORY AND NON-INVENTORY MATERIAL	1,231,800

[a]Strontium-90 purchased under DRRD program.

Fabrication Summary

	April 1976		CY 1976		FY 1976	
	No.	Ci	No.	Ci	No.	Ci
Sources						
Fabricated	0	0	0	0	0	0
Shipped	0	0	0	0	0	0
Special Form Cans						
Fabricated	0	0	0	0	0	0
Shipped	0	0	4	134	8	504

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

Isotope	Number of Batches	Amount (Ci)
Xenon-133	2	700
Yttrium-91	1	21
Barium-140	1	1
Strontium-89	1	3
Ruthenium-103	1	75

RADIOISOTOPE SALES

J. E. Ratledge

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

Customer	Isotope	Amount
Large Quantities		
American Atomics	Tritium	7,000 Ci
New England Nuclear Corporation	Tritium	2,000 Ci
Schwarz/Mann	Tritium	1,500 Ci
Self-Powered Lighting	Tritium	2,000 Ci
U. S. Radium Corporation	Tritium	10,000 Ci
Withdrawn Items		
K-25	Iodine-131	5 mCi
Items Used in Cooperative Programs		
ORAU	Dysprosium-157	40 mCi

The radioisotope sales and shipments for the first ten months of FY 1975 and FY 1976 are given in Table 2.

Table 2. Radioisotope Sales and Shipments

Item	7-1-74 thru 4-30-75	7-1-75 thru 4-30-76
Inventory items	$ 317,453	$ 225,282
Major products	84,375	42,600
Radioisotope services	92,453	75,044
Cyclotron irradiations	84,257	142,080
Miscellaneous processed materials	107,250	43,473
Packing and Shipping	62,520	86,288
Total	$ 748,308	$ 614,767
Number of Shipments	1,319	1,369

PUBLICATIONS

REPORTS

E. Lamb, *Radioisotope Distribution Program Progress Report for March 1976*, ORNL/TM-5469, Oak Ridge National Laboratory (May 1976).

ORNL/TM-5537

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