ORNL/TM-6683

Radioisotope Distribution Program Progress Report for October 1978

E. Lamb

OAK RIDGE NATIONAL LABORATORY
OPERATED BY UNION CARBIDE CORPORATION · FOR THE DEPARTMENT OF ENERGY

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OPERATIONS DIVISION

RADIOISOTOPE DISTRIBUTION PROGRAM

PROGRESS REPORT FOR OCTOBER 1978

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Work Sponsored by
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SUMMARY

Information is reported on new production, inventory status, operational problems, and radioisotope sales.

RADIOISOTOPE PRODUCTION AND MATERIALS

REACTOR-PRODUCED RADIOISOTOPES

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

	Processed Units
Radioisotope	Amount (mCi)
Calcium-47	15

Iridium-192 Production (*R. W. Schaich*)

Three customer irradiation units and eight ORNL HFIR units (RB) containing 86,000 curies of ^{192}Ir at HFIR discharge date were processed during the month of October 1978. Twelve shipments containing 76,352 curies of ^{192}Ir were made during this period.

ACCELERATOR-PRODUCED ISOTOPES

Cyclotron Service Irradiations (*M. R. Skidmore*)
(Production and Inventory Accounts)

During October 1978, the ORNL 86-Inch Cyclotron operated 4:40 hours on ORNL programs for total charges of $565, and 302:30 hours on Non-ORNL Programs for total charges of $50,578.

Four runs were interrupted this month due to shorted 1000 pF vacuum capacitors in the R.F. system. Operations were also interrupted four times due to failure in the power supplies in the R.F. system. The startup of one run was delayed due to the failure of a gasket in the target vacuum lock system and one run was interrupted by the failure of the cooling water system which furnishes cooling water to the building in which the Cyclotron is located.

FISSION PRODUCTS

Krypton-85 Enrichment Facility (*R. W. Schaich*)

Maintenance personnel leak tested the south bank of Krypton Thermal Diffusion Columns and reported no leaks and no blockages. The south bank was loaded with feed material (two columns) and enriched material (one column). It is estimated that close to 40% enriched material should be obtained during this cycle if the column operates according to design. In the north bank, AB column was loaded with partially enriched material, B column was loaded with feed material, and the columns were placed in operation. Column A is inoperative due to leakage under operating conditions. Several outages occurred due to refrigeration unit failure. The problem was determined to be a malfunction in the cooling tower fan controls. This problem has been corrected.

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

1. Process Status

The ^{137}Cs processing equipment has been placed in standby status.

2. Operational Summary

Product Inventory

(Decay calculated through August 31, 1978)

Inventory Material	Amount (Ci)
Cesium-137 chloride powder	8,300
Total Inventory Material	8,300

Non-Inventory Material	Amount (Ci)
Reject Pellets and Sources	4,300
Special Form Cans	4,000
Material returned or stored for customer	
J. L. Shepherd	22,535
New England Nuclear Corporation	1,975
Puerto Rico Sources	7,700
Lockheed	19,100
AECL powder	36,949
Radiation Resources	19,100
Gamma Industries	8,200
Total Non-Inventory Material	123,859
TOTAL INVENTORY AND NON-INVENTORY MATERIAL	132,159

Fabrication Summary

	Oct. 1978		CY 1978		FY 1979	
	No.	Ci	No.	Ci	No.	Ci
Sources						
Fabricated	0	0	41	76,110	0	0
Shipped	0	0	34	57,635	0	0
Special Form Cans						
Fabricated	0	0	21	15,600	0	0
Shipped	0	0	11	3,625	0	0

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

Four ^{90}Sr titanate heat sources are being fabricated for Teledyne Energy Systems. Each unit will contain 260 W_T of ^{90}Sr and will be fabricated from the old SNAP-7F material.

Product Inventory

(Decay calculated through August 31, 1978)

Inventory Material	Amount (Ci)
^{90}Sr titanate powder (±5%)	0
Sources in fabrication	153,000
Stock powder cans	3,170
Stock solution	180
Total Inventory Material	156,350

Non-Inventory Material	Amount (Ci)
^{90}Sr Fluoride	60,000
New England Nuclear Corporation	175
Batch 26Sr-74RE	7,700
Calorimeter Standards	4,700
Weather Bureau Source	11,100
SNAP-7B	152,500
SNAP-7C	24,000
SNAP-7D	139,500
SNAP material purchase	126,700
Total Non-Inventory Material	526,375
TOTAL INVENTORY AND NON-INVENTORY MATERIAL	682,725

Fabrication Summary

	Oct. 1978		CY 1978		FY 1979	
	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	6	40	0	0
Shipped	0	0	4	55	0	0

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

The production of short-lived fission products is listed in the table below.

Isotope	Number of Batches	Amount (Ci)
Strontium-89	1	25
Xenon-133	4	2500
Barium-140	1	36

RADIOISOTOPE SALES

J. E. Ratledge

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

Customer	Isotope	Amount
Large Quantities		
New England Nuclear Corporation	Tritium	10,000 Ci
American Atomics Corporation	Tritium	242,113 Ci
Saunders-Roe Developments, Ltd., England	Tritium	30,000 Ci
University of California, LLL	Tritium	4,264 Ci
Self-Powered Lighting, Ltd.	Tritium	23,000 Ci
Brandhurst Company, Ltd., England	Tritium	15,000 Ci
KMS Fusion, Inc.	Tritium	2,000 Ci
ICN Pharmaceuticals	Tritium	1,000 Ci
Withdrawn Items		
Gulf Nuclear	Iridium-192	5,656 Ci
Industrial Nuclear Company	Iridium-192	2,648 Ci
Gamma Industries	Iridium-192	17,717 Ci
Technical Operations, Inc.	Iridium-192	16,288 Ci

Customer	Isotope	Amount
Items Used in Cooperative Programs		
University of Mississippi Medical Center	Potassium-43	9 mCi
University of Southern California	Potassium-43	10 mCi
V.A. Center, Wood, Wisconsin	Platinum-195m	2 mCi
V.A. Center, Austin, Texas	Platinum-195m	15 mCi

The radioisotope sales and shipments for the first month of fiscal year 1978 and fiscal year 1979 are given in Table 1.

Table 1. Radioisotope Sales and Shipments

Item	10-1-77 thru 10-31-77	10-1-78 thru 10-31-78
Inventory Items	$ 88,070	$ 26,239
Tritium		246,824
Major Products	11,051	18,967
Iridium-192		57,719
Radioisotope Services	40,118	13,673
Cyclotron Irradiations	24,688	30,988
Miscellaneous Processed Materials	4,909	8,394
Packing and Shipping	15,415	15,070
Total	$ 184,250	$ 417,874
Number of Shipments	186	181

PUBLICATIONS

REPORTS

E. Lamb, *Radioisotope Distribution Program Progress Report for September 1978*, ORNL/TM-6650, Oak Ridge National Laboratory (October 1978).

INTERNAL DISTRIBUTION

1. F. N. Case
2. W. R. Casto
3. J. A. Cox
4. R. F. Hibbs
5. F. F. Knapp
6. E. Lamb
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8. H. H. Nichol
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11. M. E. Ramsey
12. J. E. Ratledge
13. C. R. Richmond
14. R. W. Schaich
15. M. R. Skidmore
16. M. J. Skinner
17-18. Central Research Library
19-20. Laboratory Records Department
21. Laboratory Records - RC
22. Document Reference Section

EXTERNAL DISTRIBUTION

23. B. J. Dropesky, LASL, Los Alamos, New Mexico
24-25. J. H. Jarrett, PNL, Richland, Washington
26. J. N. Maddox, DOE-DBER, Washington, D.C.
27. H. A. O'Brien, LASL, Los Alamos, New Mexico
28. F. J. Skozen (Krizek), Argonne Cancer Research Hospital, Chicago, Ill.
29. L. G. Stang, Jr., BNL, New York
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