

ATOMIC ENERGY COMMISSION  
APPLICATION FOR BYPRODUCT MATERIAL LICENSE

**DUPLICATED**  
Form approved by  
Budget Bureau No. 38-R027.3.  
FOR DIV. OF INSP.

INSTRUCTIONS: Complete Items 1 through 19 if this is a new application. If renewal is requested, complete only Items 1 through 11 provided that with respect to the other items there has been no change in the information previously submitted. Mail two copies to: U. S. Atomic Energy Commission, P. O. Box E, Oak Ridge, Tennessee, Attention: Isotopes Extension, Division of Civilian Application. Upon approval of this application, the applicant will receive an AEC Byproduct Material License. General requirements for issuance of an AEC Byproduct Material License are contained in Title 10, Code of Federal Regulations, Part 30.

1. (a) NAME AND SHIPPING ADDRESS OF APPLICANT <i>(Institution, firm, hospital, person, etc.)</i>	(b) ADDRESS(ES) AT WHICH BYPRODUCT MATERIAL WILL BE USED <i>(If different from shipping address)</i>
General Medical and Surgical Hospital, Radioisotope Service, Veterans Administration Center Los Angeles 25, California	Same
2. DEPARTMENT TO USE BYPRODUCT MATERIAL Chromatography Section	
3. INDIVIDUAL USER <i>(Name and title of individual(s) who will use or directly supervise use of byproduct material)</i> William Drell, Ph.D., Established Investigator, American Heart Association	
4. RADIOLOGICAL SAFETY OFFICER <i>(Name of person qualified in radiological safety, if other than individual user)</i> William H. Bland, M.D., Assistant Chief, Radioisotope Service	
5. PREVIOUS LICENSE OR AUTHORIZATION NUMBER <i>(If this is an application for renewal of a license for byproduct material obtained under a prior license or authorization for radioisotope procurement)</i> 4-181-3	

BYPRODUCT MATERIAL OR IRRADIATION SERVICE DESIRED

6. BYPRODUCT MATERIAL <i>(Element and mass number)</i> C <sup>14</sup>	7. CHEMICAL AND/OR PHYSICAL FORM <i>(Or catalog number)</i> BaC <sup>14</sup> O <sub>3</sub> and C <sup>14</sup> -tyrosine	8. MAXIMUM AMOUNT OF RADIOACTIVITY IN MILLICURIES THAT YOU WILL POSSESS AT ANY ONE TIME 350 millicuries
9. IF IRRADIATION SERVICE IS DESIRED, STATE PERTINENT DETAILS SUCH AS: CHEMICAL COMPOSITION AND WEIGHT IN GRAMS OF TARGET MATERIAL, RADIOACTIVITY, IRRADIATION TIME IN DAYS, AND NEUTRON FLUX		

STATEMENT OF USE

10. (a) DESCRIBE PURPOSE FOR WHICH BYPRODUCT MATERIAL WILL BE USED. *(If material is for "human use" complete Supplement A in lieu of this item. If material is to be used in or manufactured as a "sealed source" complete Supplement B in addition to this item.)*  
The BaC<sup>14</sup>O<sub>3</sub> will be converted into C<sup>14</sup> glycine and postulated precursors of the sympathomimetic amines of high specific activity and their rate of conversion into sympathin in organs and tissues of various animals will be studied by adsorption, ion-exchange, and paper chromatography. A similar study will be carried out with tyrosine.

(b) DESCRIBE PROCEDURES WHICH WILL BE OBSERVED TO MINIMIZE HAZARD FROM HANDLING, STORAGE, AND DISPOSAL OF THE BYPRODUCT MATERIAL  
See Items 16, 17, 18, and 19, License No. 4-181-2; and in addition disposal by burial in the soil, by dilution method with a stable isotope, and in public sewers.

CERTIFICATE

11. The applicant and any official executing this certificate on behalf of the applicant named in Item 1, certify that this application is prepared in conformity with Title 10, Code of Federal Regulations, Part 30, and do solemnly swear (or affirm) that all information contained herein, including any supplements attached hereto, is true and correct to the best of our knowledge and belief.

State of California Veterans Administration  
County of Los Angeles Applicant named in Item 1  
Subscribed and sworn to before me this 24<sup>th</sup> day of August, 1956 By William H. Bland, Chief, Radioisotope Service  
Title of Certifying Official  
Date AUG 24 1956  
Notary Public [Signature] My Commission Expires Sept. 21, 1957

WARNING

18 U. S. C., Section 1001; Act of June 25, 1948; 62 Stat. 749; makes it a criminal offense to knowingly make a false representation to any department or agency of the United States as to any matter within its jurisdiction.

A. GRAHAM ROBERTS, JR.  
Chief, Radioisotope Division  
Atomic Medicine Section  
Veterans Administration  
Burial in Sewer

**APPLICATION FOR BYPRODUCT MATERIAL LICENSE**

INSTRUCTIONS: Complete Items 12 through 19 if this is a new application. This information may be omitted from subsequent applications provided there is no change in the information previously submitted, and reference is made in Item 5 to the application on which this information appears.

**TRAINING AND EXPERIENCE WITH RADIOACTIVITY OF INDIVIDUAL USER NAMED IN ITEM 3**

12. TYPE OF TRAINING	WHERE TRAINED	DURATION OF TRAINING	ON THE JOB (Circle answer)		FORMAL COURSE (Circle answer)	
			Yes	No	Yes	No
1. Principles and practices of radiological health safety. . . . .	See Application - License No. 39199		Yes	No	Yes	No
2. Radioactivity measurement standardization and monitoring techniques and instruments . . . . .			Yes	No	Yes	No
3. Mathematics and calculations basic to the use and measurement of radioactivity. . . . .			Yes	No	Yes	No
4. Biological effects of radiation. . . . .			Yes	No	Yes	No
5. Actual use of radioisotopes in the types and quantities for which application is being made, or equivalent experience . . . . .			Yes	No	Yes	No

**13. ISOTOPE HANDLING EXPERIENCE**

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE

14. If Radiological Safety Officer named in Item 4 is different from individual user named in Item 3, use supplementary sheet to provide equivalent information on "Training and Experience With Radioactivity of Radiological Safety Officer." Supplementary sheet is attached (Circle answer) See previous application from this station Yes No

**PHYSICAL FACILITIES, EQUIPMENT, AND RADIATION INSTRUMENTATION**

**15. RADIATION DETECTION INSTRUMENTS** (Use separate sheet if necessary)

TYPE OF INSTRUMENTS (Include make and model number of each)	NUMBER AVAILABLE	RADIATION DETECTED	SENSITIVITY RANGE (mr/hr)	WINDOW THICKNESS (mg/cm <sup>2</sup> )	USE (Monitoring, surveying, measuring)
See License No. 4-181-2					

**16. FILM BADGES, DOSIMETERS, AND OTHER PERSONNEL MONITORING DEVICES INCLUDING BIO-ASSAY PROCEDURES**

See License No. 4-181-2

**17. METHOD, FREQUENCY, AND STANDARDS USED IN CALIBRATING INSTRUMENTS LISTED ABOVE** (For film badges specify method of calibration and processing, or name supplier)

See License No. 4-181-2

**18. (a) DESCRIBE BRIEFLY REMOTE HANDLING EQUIPMENT, STORAGE CONTAINERS, SHIELDING, AND LABORATORY FACILITIES** (Working areas, fume hoods, etc.)

See License No. 4-181-2

(b) SKETCHES OF SUCH FACILITIES ARE ATTACHED (Circle answer)

Yes No

**19. DESCRIBE BRIEFLY RADIATION SURVEYING PROCEDURES AND METHODS OF DISPOSING OF RADIOACTIVE WASTES**

See License No. 4-181-2

88392

RADIOISOTOPE SHIPPING DOCUMENT  
OAK RIDGE NATIONAL LABORATORY  
OPERATED FOR U. S. ATOMIC ENERGY COMMISSION  
UNION CARBIDE NUCLEAR COMPANY

A DIVISION OF  
UNION CARBIDE AND CARBON CORPORATION  
OAK RIDGE, TENNESSEE

RADIOISOTOPE ORDER NO.  
1009-156

RAIL EXPRESS

10-3-56

CUSTOMER'S ORDER NO. LTR. 9-25-56  
RADIOISOTOPE ORDER NO. 1009-156  
APPROVAL NO. 4-181-3  
SCHEDULED DATE 10-5-56

SHIP TO  
DR. WILLIAM DRELL  
C/O VETERANS ADMINISTRATION  
CENTER RESEARCH SERVICE  
LOS ANGELES 25, CALIFORNIA

BILL TO (IF DIFFERENT FROM SHIP TO)  
CHECKS FOR \$1,110.00 SENT TO  
ACCOUNTING 9-28-56.  
ACCOUNT NO. 3361 IS TO BE BILLED  
FOR 80% OF THE TOTAL VALUATION  
EXCLUSIVE OF CONTAINER CHARGES.  
EM-57-213

ROUTE AND SHIPPING INSTRUCTIONS  
RAIL EXPRESS (DO NOT CONVERT BECAUSE U. OF CALIF.  
IS BUYING MATERIAL).

CONTAINER NO.  
RR

BILLING INSTRUCTIONS

CUSTOMER CODE 980  
CUSTOMER TYPE 6

SALE CODE 5 1  
MATERIAL TYPE 3651-51-20

DESCRIPTION OF MATERIAL ORDERED  
BATCH 341

SPECIFIC ACTIVITY REQUESTED  
DATE SHIPPED 10-5-56  
CONTAINER WEIGHT 18

ORDERED	SHIPPED	DESCRIPTION	UNIT PRICE	EXTENSIONS	HANDLING CHARGE	CONTAINER CHARGE	TOTAL VALUATION
250 MCS	250 mc.	C 14 (P)	22.00 MC	5,500.00	10.00		5,510.00
CHEMICAL FORM		BATCH NO.	CONCENTRATION		VOLUME		SPECIFIC ACTIVITY
BaCO <sub>3</sub>		341	0.120 mc/mc		2.0834 mc/ml		mc/g

ANALYSIS  
Assayed at 8:00 A. M. 10-5-56  
PPT at pH 7  
I 133 %  
Isotopic Ratio 38.6  
Heavy Metals p.p.m.  
Total Solids mg/ml  
Non Volatile Materials mg/ml  
Normality  
Radiochemical Purity %

Gross 7.6413  
Tare 5.5579  
Net 2.0834

APPROVED FOR SHIPMENT

SHIPPED BY RADIOISOTOPE SHIPPING DEPARTMENT

SIGNED RADIOISOTOPE SALES DEPARTMENT

AI

**P. S.:** Please bear in mind that your renewal application should be coordinated through the Office of:

**Mr. A. Graham Moseley, Jr.,  
Department of Medicine and Surgery  
Veterans Administration  
Washington 25, D. C.**

<b>OFFICE ▶</b>						
<b>SURNAME ▶</b>						
<b>DATE ▶</b>						