

APPLICANT Jettysburg College Physics Department Jettysburg, Pennsylvania	LICENSE NUMBER	AMEND. NO.	EXPIRATION DATE	CONTROL NO. 3682
	DATE RECEIVED 4/25/61	DATE ISSUED VOID	7-28-61	CODE 25
	SUPERSEDES		ASSIGNMENT JEB	

37-6176-1

PERSONS NAMES
J. Richard Haskins

**NOT REPRODUCE MATERIAL
(Piled in General File)**

ISOTOPE	FORM	AMOUNT	USE

A/10

Date Received **AUG 24 1961** Expiration Date Issuance Date Tech. Reviewer *gjm*

Control No. **36842** Reference No. License No. Amendment No.

Isotope	Form	Possession Limit
A.	A.	A.
B.	B.	B.
C.	C.	C.
D.	D.	D.
E.	E.	E.
F.	F.	F.
G.	G.	G.
H.	H.	H.

Authorized Use

A.

REMARKS, Letters, Phone calls, Visits, Exemptions, Etc. (Use reverse side if necessary)

*8-28-61 Void Ltr
Co 57 cyclotron produced job*

Conditions			
1. A B C	6.	11.	16.
2. A B C	7.	12.	17.
3. A B C D	8. A B C	13.	18.
4. A B	9. A B C	14. A B C	19.
5.	10.	15.	20.
			21.

Approve Void
Tech. Reviewer Date

Mail to: Date Mailed Chief *gjm* Date *8-28-61*

9. continued

Indium - 114	1 mc	Redstone Arsenal	1 year	nuclear spectroscopy
Ruthenium - 108	1 mc	" "	1 year	" "
Niobium - 95	1 mc	" "	1 year	" "

All of these isotopes were purchased from the Radioisotope Division of the Oak Ridge National Laboratory. The Ba¹³¹ was obtained in all cases in instance as BaCl₂ in HCl solution. An other HCl solution was used to precipitate BaCl₂. The BaCl₂ was then dissolved in water. Some sources were prepared by evaporating a drop to dryness on a thin collodion film. Other sources were prepared by placing the liquid solution in a small test tube. In one case barium metal was irradiated in the Oak Ridge highest flux reactor. The radioactive metal was placed in a test tube under paraffin oil and was used as a source for gamma-gamma angular correlation experiments. The Cr⁵¹ was received as CrCl₃ in HCl solution. Sources were made by evaporating to dryness a drop on a thin collodion film mounted on a plastic ring. The conversion electrons of the 0.32 Mev gamma ray were used for calibration purposes with an anthracene scintillation spectrometer. The Co⁵⁸ was received as CoCl₂ in HCl solution. It was used as received in a small test tube. The 0.51 Mev annihilation radiation was used for calibration purposes in gamma-gamma angular correlation experiments.

10. continued

3. Nuclear of Chicago 6 available beta and gamma 1.4 mg/cm² measuring D-37A geiger tube
4. Nuclear of Chicago 2 available neutrons monitor and 206 BF₃ counter tube measuring
13. In one corner of the modern physics lab is a small closet which is kept locked in which sources are stored. The sources are shielded by four inches of lead and sixteen inches of concrete. Also in this laboratory is a fume-hood for use in source preparation. There is a sink in the hood and a sink outside of the hood.
14. All source preparation will be performed in the hood. Careful monitoring will be done. Pocket dosimeters will be worn.
15. The Co-57 will be allowed to decay in the storage vault. Eventually it would be disposed of by dilution and washing down the drain into the sewerage system.

APPLICATION FOR BYPRODUCT MATERIAL LICENSE

for Division of Compliance

INSTRUCTIONS.—Complete Items 1 through 16 if this is an initial application. If application is for renewal of a license, complete only Items 1 through 7 and indicate new information or changes in the program as requested in Items 8 through 15. Use supplemental sheets where necessary. Item 16 must be completed on all applications. Mail three copies to: U. S. Atomic Energy Commission, Washington 25, D. C. Attention: Isotopes Branch, Division of Licensing and Regulation. Upon approval of this application, the applicant will receive an AEC Byproduct Material License. An AEC Byproduct Material License is issued in accordance with the general requirements contained in Title 10, Code of Federal Regulations, Part 30 and the Licensee is subject to Title 10, Code of Federal Regulations, Part 20.

1. (a) NAME AND STREET ADDRESS OF APPLICANT. (Institution, firm, hospital, person, etc.) (b) STREET ADDRESS(ES) AT WHICH BYPRODUCT MATERIAL WILL BE USED. (If different from 1 (a).)

**Gettysburg College
Gettysburg, Pennsylvania**

Not applicable

2. DEPARTMENT TO USE BYPRODUCT MATERIAL 3. PREVIOUS LICENSE NUMBER(S). (If this is an application for renewal of a license, please indicate and give number.)

Physics Department

37-6176-1 (BGE) current license

4. INDIVIDUAL USER(S). (Name and title of individual(s) who will use or directly supervise use of byproduct material. Give training and experience in Items 8 and 9.) 5. RADIATION PROTECTION OFFICER (Name of person designated as radiation protection officer if other than individual user. Attach resume of his training and experience as in Items 8 and 9.)

**J. Richard Haskins, Assistant Professor
of Physics**

Not applicable

6. (a) BYPRODUCT MATERIAL. (Elements and mass number of each.) (b) CHEMICAL AND/OR PHYSICAL FORM AND MAXIMUM NUMBER OF MILLICURIES OF EACH CHEMICAL AND/OR PHYSICAL FORM THAT YOU WILL POSSESS AT ANY ONE TIME. (If sealed source(s), also state name of manufacturer, model number, number of sources and maximum activity per source.)

Cobalt-57

Co Cl₂ in HCl solution 5 millicuries

7. DESCRIBE PURPOSE FOR WHICH BYPRODUCT MATERIAL WILL BE USED. (If byproduct material is for "human use," supplement A (Form AEC-313a) must be completed in lieu of this item. If byproduct material is in the form of a sealed source, include the make and model number of the storage container and/or device in which the source will be stored and/or used.)

The Cobalt-57 is to be used in the development of an experiment utilizing the Moessbauer effect for use in a senior modern physics laboratory.

30042

9. continued

Indium - 114	1 mg	Bedstone Arsenal	1 year	nuclear spectroscopy
Ruthenium - 108	1 mg	"	1 year	"
Rubidium - 85	1 mg	"	1 year	"

All of these isotopes were purchased from the Radioisotope Division of the Oak Ridge National Laboratory. The Ba¹³⁷ was obtained in all but one instance as BaCl₂ in HCl solution. An ether-HCl solution was used to precipitate BaCl₂. The BaCl₂ was then dissolved in water. Some sources were prepared by evaporating a drop to dryness on a thin collodion film. Other sources were prepared by placing the liquid solution in a small test tube. In one case barium metal was irradiated in the Oak Ridge highest flux reactor. The radioactive metal was placed in a test tube under paraffin oil and was used as a source for gamma-gamma angular correlation experiments. The metal was received as GrCl₃ in HCl solution. Sources were made by evaporating to dryness a drop on a thin collodion film mounted on a plastic ring. The concentration of the 0.52 Mev gamma ray were used for calibration purposes with an anthracene scintillation spectrometer. The Co⁶⁰ was received as CoCl₂ in HCl solution. It was used as received in a small test tube. The 0.51 Mev annihilation radiation was used for calibration purposes in gamma-gamma angular correlation experiments.

10. continued

3. Nuclear of Chicago 6 available beta and gamma 1.4 mg/cm² measuring D-57A Geiger tube
4. Nuclear of Chicago 2 available neutrons monitor and 306 BF₃ counter tube measuring
13. In one corner of the modern physics lab is a small closet which is kept locked in which sources are stored. The sources are shielded by four inches of lead and sixteen inches of concrete. Also in this laboratory is a fume-hood for use in source preparation. There is a sink in the hood and a sink outside of the hood.
14. All source preparation will be performed in the hood. Careful monitoring will be done. Pocket dosimeters will be worn.
15. The Co-60 will be allowed to decay in the storage vault. Eventually it would be disposed of by dilution and washing down the drain into the sewerage system.