

U.S. NUCLEAR REGULATORY COMMISSION

**MATERIALS LICENSE**

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 36, 37, 39, 40, 70, and 71, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations, and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

<p style="text-align: center;">Licensee</p> <p>1. DePauw University 2. Chemistry Department 602 S. College Avenue Greencastle, IN 46135</p>	<p>In accordance with letter dated July 18, 2016,</p> <p>3. License number 13-26020-01 is amended in its entirety to read as follows:</p> <hr/> <p>4. Expiration date March 31, 2021</p> <hr/> <p>5. Docket No. 030-31023 Reference No.</p>
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6. Byproduct, source, and/or special nuclear material	7. Chemical and/or physical form	8. Maximum amount that licensee may possess at any one time under this license
A. Hydrogen-3	A. Any	A. 10 millicuries
B. Carbon-14	B. Any	B. 10 millicuries
C. Phosphorus-32	C. Any	C. 25 millicuries
D. Sulfur-35	D. Any	D. 25 millicuries
E. Polonium-209	E. Any	E. 1 microcurie
F. Cadmium-109	F. Dissolved in solution (non-volatile)	F. Not to exceed a total of 2 microcuries
G. Cobalt-57	G. Dissolved in solution (non-volatile)	G. Not to exceed a total of 1 microcurie
H. Cerium-139	H. Dissolved in solution (non-volatile)	K. Not to exceed a total of 1 microcurie
I. Mercury-203	I. Dissolved in acid solution (non-volatile)	I. Not to exceed a total of 1 microcurie
J. Tin-113	J. Dissolved in solution (non-volatile)	J. Not to exceed a total of 1 microcurie
K. Strontium-85	K. Dissolved in solution (non-volatile)	K. Not to exceed a total of 1 microcurie
L. Cesium-137	L. Dissolved in solution (non-volatile)	L. Not to exceed a total of 1 microcurie

**MATERIALS LICENSE  
SUPPLEMENTARY SHEET**

License Number  
13-26020-01

Docket or Reference Number  
030-31023

Amendment No. 10

6. Byproduct, source, and/or special nuclear material	7. Chemical and/or physical form	8. Maximum amount that licensee may possess at any one time under this license
M. Cobalt-60	M. Dissolved in solution (non-volatile)	M. Not to exceed a total of 1 microcurie
N. Yttrium-88	N. Dissolved in solution (non-volatile)	N. Not to exceed a total of 2 microcuries
O. Lead-210	O. Dissolved in solution (non-volatile)	O. Not to exceed a total of 2 microcuries
P. Cadmium-109	P. Sealed source (AEA #QCRB4136)	P. Not to exceed a total of 2 microcuries
Q. Cobalt-57	Q. Sealed source (AEA #QCRB4136)	Q. Not to exceed a total of 2 microcuries
R. Lead-210	R. Sealed source (AEA #QCRB4136)	R. Not to exceed a total of 2 microcuries
S. Americium-241	S. Sealed source (AEA #QCRB4136)	S. Not to exceed a total of 1 microcuries

9. Authorized use:

- A. through E. To be used for research and development as defined in 10 CFR Part 30, Section 30.4, and student instruction.
- F. through S. To be used for instrument calibration.

CONDITIONS

10. Licensed material may be used only at the licensee's facilities located within Julian Science and Math Building at 602 South College Avenue, Greencastle, Indiana.
11. The Radiation Safety Officer for this license is David Roberts, Ph.D.
12. Licensed material shall be used by, or under the supervision of, individuals designated in writing by David Roberts, Ph.D., Radiation Safety Officer. The licensee shall maintain records of individuals designated as users for 3 years after the individual's last use of licensed material.
13. Sealed sources containing licensed material shall not be opened or sources removed from the source holder by the licensee.

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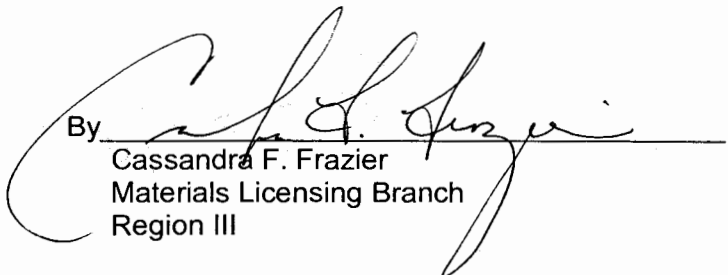
14. Licensed material shall not be used in or on human beings or in field applications where activity is released, except as provided otherwise by specific condition of this license.
15. The licensee is authorized to hold radioactive material with a physical half-life of less than or equal to 120 days for decay-in-storage before disposal in ordinary trash provided:
  - A. Before disposal as ordinary trash, byproduct material shall be surveyed at the container surface with the appropriate survey meter set on its most sensitive scale and with no interposed shielding to determine that its radioactivity cannot be distinguished from background. All radiation labels shall be removed or obliterated.
  - B. A record of each disposal permitted under this License Condition shall be retained for three years. The record must include the date of disposal, the date on which the byproduct material was placed in storage, the radionuclides disposed, the survey instrument used, the background dose rate, the dose rate measured at the surface of each waste container, and the name of the individual who performed the disposal.
16. The licensee shall conduct a physical inventory every six months, or at other intervals approved by NRC, to account for all sources and/or devices received and possessed under the license. Records of inventories shall be maintained for three years from the date of each inventory and shall include the radionuclides, quantities, manufacturer's name and model numbers, and the date of the inventory.
17. Maintenance, repair, cleaning, replacement, and disposal of foils contained in detector cells shall be performed only by the device manufacturer or other persons specifically authorized by the Commission or an Agreement State to perform such services.
18.
  - A. Sealed sources shall be tested for leakage and/or contamination at intervals not to exceed the intervals specified in the certificate of registration issued by NRC under 10 CFR 32.210 or by an Agreement State.
  - B. In the absence of a certificate from a transferor indicating that a leak test has been made within the intervals specified in the certificate of registration issued by NRC under 10 CFR 32.210 or by an Agreement State prior to the transfer, a sealed source or detector cell received from another person shall not be put into use until tested.
  - C. Sealed sources need not be tested if they contain only hydrogen 3; or they contain only a radioactive gas; or the half-life of the isotope is 30 days or less; or they contain not more than 100 microcuries of beta- and/or gamma-emitting material or not more than 10 microcuries of alpha-emitting material.
  - D. Sealed sources need not be tested if they are in storage and are not being used. However, when they are removed from storage for use or transferred to another person, and have not been tested within the required leak test interval, they shall be tested before use or transfer. No sealed source shall be stored for a period of more than 10 years without being tested for leakage and/or contamination.

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- E. The leak test shall be capable of detecting the presence of 0.005 microcurie (185 becquerels) of radioactive material on the test sample. If the test reveals the presence of 0.005 microcurie (185 becquerels) or more of removable contamination, a report shall be filed with the U.S. Nuclear Regulatory Commission in accordance with 10 CFR 30.50(c)(2), and the source shall be removed immediately from service and decontaminated, repaired, or disposed of in accordance with Commission regulations.
- F. Tests for leakage and/or contamination shall be performed by persons specifically licensed by the Commission or an Agreement State to perform such services. In addition, the licensee is authorized to collect leak test samples but not perform the analysis: analysis of leak samples must be performed by persons specifically licensed by the Commission or an Agreement State to perform such services.
- G. Records of leak tests results shall be kept in units of microcuries and shall be maintained for three years.
19. Except as specifically provided otherwise in this license, the licensee shall conduct its program in accordance with the statements, representations, and procedures contained in the documents, including any enclosures, listed below. This license condition applies only to those procedures that are required to be submitted in accordance with the regulations. The U.S. Nuclear Regulatory Commission's regulations shall govern unless the statements, representations, and procedures in the licensee's application and correspondence are more restrictive than the regulations.
- A. Application dated October 27, 2010 (ML103000222)  
B. Letter dated March 17, 2016 (ML16077A273)  
C. Letter dated July 18, 2016 (ML16201A244)

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Date SEP 22 2016By   
Cassandra F. Frazier  
Materials Licensing Branch  
Region III