

APPLICATION FOR BYPRODUCT MATERIAL LICENSE
INDUSTRIAL

1. APPLICATION FOR:
(Check and/or complete as appropriate)

X a. NEW LICENSE

b. AMENDMENT TO:
LICENSE NUMBER

c. RENEWAL OF:
LICENSE NUMBER

See attached instructions for details.

Completed applications are filed in duplicate with the Division of Fuel Cycle and Material Safety, Office of Nuclear Material Safety, and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555 or applications may be filed in person at the Commission's office at 1717 H Street, NW, Washington, D. C. or 7915 Eastern Avenue, Silver Spring, Maryland.

2. APPLICANT'S NAME (Institution, firm, person, etc.)

UOP Inc. 312 - 391-2000

TELEPHONE NUMBER: AREA CODE - NUMBER EXTENSION

3. NAME AND TITLE OF PERSON TO BE CONTACTED
REGARDING THIS APPLICATION

Victor C. Patton 312 - 442-7400

TELEPHONE NUMBER: AREA CODE - NUMBER EXTENSION

4. APPLICANT'S MAILING ADDRESS (Include Zip Code)

(Address to which NRC correspondence, notices, bulletins, etc., should be sent.)

UOP Inc.
Drawer C
Riverside, IL 60546

5. STREET ADDRESS WHERE LICENSED MATERIAL WILL BE USED
(Include Zip Code)

UOP Inc.
Lawndale & Joliet Rds.
McCook, IL 60525

(IF MORE SPACE IS NEEDED FOR ANY ITEM, USE ADDITIONAL PROPERLY KEYED PAGES.)

6. INDIVIDUAL(S) WHO WILL USE OR DIRECTLY SUPERVISE THE USE OF LICENSED MATERIAL

(See Items 16 and 17 for required training and experience of each individual named below)

FULL NAME

TITLE

a. Victor C. Patton, MS

Supervisor, Biological Dev. Lab

b. Richard E. Swanson, MS

Biotechnologist

c.

7. RADIATION PROTECTION OFFICER

Victor C. Patton

Attach a resume of person's training and experience as outlined in Items 16 and 17 and describe his responsibilities under Item 15.

8. LICENSED MATERIAL

L I N E NO.	ELEMENT AND MASS NUMBER A	CHEMICAL AND/OR PHYSICAL FORM B	NAME OF MANUFACTURER AND MODEL NUMBER (If Sealed Source) C	MAXIMUM NUMBER OF RILLICURIES AND/OR SEALED SOURCES AND MAXIMUM ACTI- VITY PER SOURCE WHICH WILL BE POSSESSED AT ANY ONE TIME D
(1)	3-Hydrogen	Various organic compounds	Amersham or other Mfg.	1m Ci
(2)	14-Carbon	Various organic compounds	Amersham or other Mfg.	5m Ci
(3)	125-Iodine	KI	Amersham or other Mfg.	1m Ci
(4)	99M-Technetium	Pertechnetate	Amersham or New England Nuclear	1m Ci

DESCRIBE USE OF LICENSED MATERIAL
E

(1) See Item 8E of typed document.

(2)

(3)

8503180043 850228
REG3 LIC30
12-18770-02 PDR

(4)

License Fee Information
on Next Page

9. STORAGE OF SEALED SOURCES

LINE NO.	CONTAINER AND/OR DEVICE IN WHICH EACH SEALED SOURCE WILL BE STORED OR USED. A.	NAME OF MANUFACTURER B.	MODEL NUMBER C.
(1)	See Item 13 of typed document.		
(2)			
(3)			
(4)			

10. RADIATION DETECTION INSTRUMENTS

LINE NO.	TYPE OF INSTRUMENT A	MANUFACTURER'S NAME B	MODEL NUMBER C	NUMBER AVAILABLE D	RADIATION DETECTED (alpha, beta, gamma, neutron) E	SENSITIVITY RANGE (milliroentgens/hour or counts/minute) F
(1)	Survey Meter	Warrington	2684	1	See attached spec sheet.	
(2)	Gamma Counter	Abbott	PMA-1	*	Gamma 20 to	40,000 CPM
(3)						
(4)						

11. CALIBRATION OF INSTRUMENTS LISTED IN ITEM 10

<input checked="" type="checkbox"/> a. CALIBRATED BY SERVICE COMPANY NAME, ADDRESS, AND FREQUENCY (1) Midwest Calibration Center 5213 W. Lawrence Chicago, IL 60630 Twice Yearly	<input type="checkbox"/> b. CALIBRATED BY APPLICANT <i>Attach a separate sheet describing method, frequency and standards used for calibrating instruments.</i>
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12. PERSONNEL MONITORING DEVICES

TYPE (Check and/or complete as appropriate.) A	SUPPLIER (Service Company) B	EXCHANGE FREQUENCY C
<input checked="" type="checkbox"/> (1) FILM BADGE <input checked="" type="checkbox"/> (2) THERMOLUMINESCENCE DOSIMETER (TLD) <input type="checkbox"/> (3) OTHER (Specify): _____ _____ _____	Siemens Health Physics Box 1367 Oakton St. Sta. Des Plaines, IL	<input checked="" type="checkbox"/> MONTHLY <input type="checkbox"/> QUARTERLY <input type="checkbox"/> OTHER (Specify): _____ _____ _____

13. FACILITIES AND EQUIPMENT (Check where appropriate and attach annotated sketch(es) and description(s).)

- ☒ a. LABORATORY FACILITIES, PLANT FACILITIES, FUME HOODS (Include filtration, if any), ETC.
☐ b. STORAGE FACILITIES, CONTAINERS, SPECIAL SHIELDING (fixed and/or temporary), ETC.
☐ c. REMOTE HANDLING TOOLS OR EQUIPMENT, ETC.
☐ d. RESPIRATORY PROTECTIVE EQUIPMENT, ETC.

14. WASTE DISPOSAL

- a. NAME OF COMMERCIAL WASTE DISPOSAL SERVICE EMPLOYED
Atomic Disposal Co., 14352 Kedzie Ave. (P. O. Box 32), Tinley Park, IL
- b. IF COMMERCIAL WASTE DISPOSAL SERVICE IS NOT EMPLOYED, SUBMIT A DETAILED DESCRIPTION OF METHODS WHICH WILL BE USED FOR DISPOSING OF RADIOACTIVE WASTES AND ESTIMATES OF THE TYPE AND AMOUNT OF ACTIVITY INVOLVED. IF THE APPLICATION IS FOR SEALED SOURCES AND DEVICES AND THEY WILL BE RETURNED TO THE MANUFACTURER, SO STATE.

INFORMATION REQUIRED FOR ITEMS 15, 16 AND 17

Describe in detail the information required for Items 15, 16 and 17. Begin each item on a separate page and key to the application as follows:

15. RADIATION PROTECTION PROGRAM. Describe the radiation protection program as appropriate for the material to be used including the duties and responsibilities of the Radiation Protection Officer, control measures, bioassay procedures (if needed), day-to-day general safety instruction to be followed, etc. If the application is for sealed source's also submit leak testing procedures, or if leak testing will be performed using a leak test kit, specify manufacturer and model number of the leak test kit.
16. FORMAL TRAINING IN RADIATION SAFETY. Attach a resume for each individual named in Items 6 and 7. Describe individual's formal training in the following areas where applicable. Include the name of person or institution providing the training, duration of training, when training was received, etc.
 - a. Principles and practices of radiation protection.
 - b. Radioactivity measurement standardization and monitoring techniques and instruments.
 - c. Mathematics and calculations basic to the use and measurement of radioactivity.
 - d. Biological effects of radiation.
17. EXPERIENCE. Attach a resume for each individual named in Items 6 and 7. Describe individual's work experience with radiation, including where experience was obtained. Work experience or on-the-job training should be commensurate with the proposed use. Include list of radioisotopes and maximum activity of each used.

RECEIVED BY LFMB	
Date	8/30/84
Log	Aug 26-TH
By	Jacques
Orig. to	RTU
Action Compl.	JP

Applicant	116871
Check No.	116871
Amount/Fee Category	1190
Type of Fee	application
Date Check Recd.	8/30/84
Received By	Jacques

18. CERTIFICATE

(This item must be completed by applicant)

The applicant and any official executing this certificate on behalf of the applicant named in Item 2, certify that this application is prepared in conformity with Title 10, Code of Federal Regulations, Part 30, and that all information contained herein, including any supplements attached hereto, is true and correct to the best of our knowledge and belief.

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

a. LICENSE FEE REQUIRED (See Section 170.31, 10 CFR 170)	b. CERTIFYING OFFICIAL (Signature) <i>Algie J. Conner</i>
	c. NAME (Type or print) Algie J. Conner
(1) LICENSE FEE CATEGORY: Control No. 77363	d. TITLE Director - Experimental Development
(2) LICENSE FEE ENCLOSED: \$	e. DATE July 30, 1984
	Dept.

Item 8E - Lines 1-4

1. 3-H

- a. Very accurate measurement of surface acidity on inorganic catalysts by isotope exchange. This measurement technique may prove superior to existing techniques.
- b. Specific applications where the use of dual-labels (^3H - ^{14}C) facilitate the experimental work.

2. 14-C

- a. To measure dissociation of organic polymer-protein complexes.
- b. To identify important nutritional elements for micro organisms under study.

3. 125-I

To prepare radio labeled proteins.

4. 99M-Tc

To model metal impregnation and uptake by inorganic materials.

Item 13

(a) Storage of Isotopes

No sealed sources are being considered at this time. Radioisotopes purchased for experimental work will be stored in the original container as supplied by the manufacturer. These isotopes will be stored as required by CFR Title 10, Part 20, Section 20-203. Storage will be in the laboratory location proposed in Part 13 of this application.

(b) Working Area

A radiochemical laboratory will be designated for this purpose. The proposed laboratory will be approximately 150 ft². Of this approximately 50 ft² will be bench space. This area will be posted limited access. All working surfaces will be covered with polyethylene backed adsorbent paper. A fume hood suitable for radiochemistry will be permanently installed in the laboratory.

Item 15 Radiation Protection Program

The radiation protection program will be designed to ensure a responsible use of radioactive materials. It will be administered by the Radiation Safety Officer and his delegates.

Outline

1. Receipt of Radionuclides
2. Storage of Nuclides
3. Training Program
4. Health Physics Program
5. Facilities Survey
6. Accident Management
7. Exposure Records
8. Use Requests
9. License Updates

This program is intended to insure that safe practices are used in keeping with good chemical and radiochemical procedures. The specific goals of the program are to make sure that, for example, the following practices are carried out:

Item 15 (cont.)

1. Use of isotopes in strictly defined areas that are labeled to warn others that radioactive materials are present.
2. The use of laboratory coats and gloves for personnel protection.
3. The use of plastic-lined paper for protection against spills.
4. Monitoring for contamination by the counting in a scintillation counter monthly swabs of floor and bench-tops.
5. The use of geiger-type counters when high energy isotopes, such as ^{99m}Tc are used.
6. Monthly service of film badge monitoring for personnel protection.
7. The use of automatic pipetting devices to eliminate mouth pipetting.
8. The use of tape and labels to mark clearly all radioactive samples.
9. Maintenance of clean, uncluttered laboratories to minimize the potential for accidents.
10. Forbidding eating, drinking or smoking in areas where radioactive compounds are used.
11. The careful cataloging and record-keeping to keep track of the arrival and fate of radioactive compounds obtained.

Radiation Protection Officer and User

Items 16 & 17

Victor C. Patton

B.S. - Biochemistry

Graduate School for M.S. in Molecular Biology

Experience:

Undergraduate: Used ^3H , ^{14}C , and ^{32}P . None in excess of 10m Ci. First exposure to lab surveys, radiation safety. Used liquid scintillation counter in single label and dual-label experiments.

Graduate: Used ^{32}P in amounts < 50m Ci. LSC and autoradiography experience.

Industry: Employed 5 years at Amersham Corp. Used ^{131}I , ^{125}I , ^{99}M Tc in amounts up to 100m Ci. Attended company training sessions in Health Physics on a monthly basis. Training by Dr. Steven Goetsch, Ph.D. Health Physics. Developed in-house methods for measurement of airborne ^3H and ^{125}I via carbon adsorption. Designed two shielded glove boxes used in production of ^{125}I -Fibrinogen. This work required of time-distance and 1/2 layer calculations.

It is our intention to ensure that a properly trained individual is present at all times radiochemicals are in use. We intend to certify an alternate RSO through attendance at Dr. Herman Cember's course on Health Physics. Dr. Cember is a professor at Northwestern University, Evanston, IL.

Items 16 & 17

Richard E. Swanson

B.S. Biology - Washington University

M.S. Biology - University of California at San Diego

Experience:

Familiar with ^{125}I from experience as a laboratory technician performing RIA.
This experience gained at the School of Medicine, Northwestern University over
four years.