

APPLICATION FOR MATERIAL LICENSE

INSTRUCTIONS: SEE THE APPROPRIATE LICENSE APPLICATION GUIDE FOR DETAILED INSTRUCTIONS FOR COMPLETING APPLICATION. SEND TWO COPIES OF THE ENTIRE COMPLETED APPLICATION TO THE NRC OFFICE SPECIFIED BELOW.

FEDERAL AGENCIES FILE APPLICATIONS WITH:

U.S. NUCLEAR REGULATORY COMMISSION
DIVISION OF FUEL CYCLE AND MATERIAL SAFETY, NMSS
WASHINGTON, DC 20555

ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS, IF YOU ARE LOCATED IN:

CONNECTICUT, DELAWARE, DISTRICT OF COLUMBIA, MAINE, MARYLAND, MASSACHUSETTS, NEW JERSEY, NEW YORK, PENNSYLVANIA, RHODE ISLAND, OR VERMONT, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION I
NUCLEAR MATERIAL SECTION B
631 PARK AVENUE
KING OF PRUSSIA, PA 19406

ALABAMA, FLORIDA, GEORGIA, KENTUCKY, MISSISSIPPI, NORTH CAROLINA, PUERTO RICO, SOUTH CAROLINA, TENNESSEE, VIRGINIA, VIRGIN ISLANDS, OR WEST VIRGINIA, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION II
MATERIAL RADIATION PROTECTION SECTION
101 MARIETTA STREET, SUITE 2900
ATLANTA, GA 30323

IF YOU ARE LOCATED IN:

ILLINOIS, INDIANA, IOWA, MICHIGAN, MINNESOTA, MISSOURI, OHIO, OR WISCONSIN, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION III
MATERIALS LICENSING SECTION
799 ROOSEVELT ROAD
GLEN ELLYN, IL 60137

ARKANSAS, COLORADO, IDAHO, KANSAS, LOUISIANA, MONTANA, NEBRASKA, NEW MEXICO, NORTH DAKOTA, OKLAHOMA, SOUTH DAKOTA, TEXAS, UTAH, OR WYOMING, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION IV
MATERIAL RADIATION PROTECTION SECTION
611 RYAN PLAZA DRIVE, SUITE 1000
ARLINGTON, TX 76011

ALASKA, ARIZONA, CALIFORNIA, HAWAII, NEVADA, OREGON, WASHINGTON, AND U.S. TERRITORIES AND POSSESSIONS IN THE PACIFIC, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION V
MATERIAL RADIATION PROTECTION SECTION
1450 MARIA LANE, SUITE 210
WALNUT CREEK, CA 94596

PERSONS LOCATED IN AGREEMENT STATES SEND APPLICATIONS TO THE U.S. NUCLEAR REGULATORY COMMISSION ONLY IF THEY WISH TO POSSESS AND USE LICENSED MATERIAL IN STATES SUBJECT TO U.S. NUCLEAR REGULATORY COMMISSION JURISDICTION.

1. THIS IS AN APPLICATION FOR (Check appropriate item)

- ☒ A. NEW LICENSE
☐ B. AMENDMENT TO LICENSE NUMBER _____
☐ C. RENEWAL OF LICENSE NUMBER _____

2. NAME AND MAILING ADDRESS OF APPLICANT (Include Zip Code)

Sigma Chemical Company
P.O. Box 14508
St. Louis, MO 63178

3. ADDRESS(ES) WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED.

Sigma Chemical Company
3050 Spruce Street
St. Louis, MO 63103

4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION

Walter C. Stern

TELEPHONE NUMBER

1 800 325-8070

SUBMIT ITEMS 5 THROUGH 11 ON 8 1/2 x 11" PAPER. THE TYPE AND SCOPE OF INFORMATION TO BE PROVIDED IS DESCRIBED IN THE LICENSE APPLICATION GUIDE.

5. RADIOACTIVE MATERIAL

a. Element and mass number, b. chemical and/or physical form, and c. maximum amount which will be possessed at any one time.

6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED.

7. INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING AND EXPERIENCE.

8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS.

9. FACILITIES AND EQUIPMENT

8509120319 850820
REG3 LIC30
24-16607-02 PDR

10. RADIATION SAFETY PROGRAM

11. WASTE MANAGEMENT

12. LICENSEE FEES (See 10 CFR 170 and Section 170.21)

FEE CATEGORY 3K AMOUNT ENCLOSED \$ 290.00

13. CERTIFICATION (Must be completed by applicant): THE APPLICANT UNDERSTANDS THAT ALL STATEMENTS AND REPRESENTATIONS MADE IN THIS APPLICATION ARE BINDING UPON THE APPLICANT.

THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATION ON BEHALF OF THE APPLICANT, NAMED IN ITEM 2, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PARTS 30, 32, 33, 34, 35, AND 40 AND THAT ALL INFORMATION CONTAINED HEREIN, IS TRUE AND CORRECT TO THE BEST OF THEIR 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.

SIGNATURE—CERTIFYING OFFICER

TYPED/PRINTED NAME

TITLE

DATE

Walter C. Stern

Walter C. Stern

Vice President

6/5/85

14. VOLUNTARY ECONOMIC DATA

a. ANNUAL RECEIPTS

< \$250K	\$1M-3.5M
\$250K-500K	\$3.5M-7M
\$500K-750K	\$7M-10M
\$750K-1M	> \$10M

b. NUMBER OF EMPLOYEES (Total for entire facility excluding outside contractors)

c. NUMBER OF BEDS

d. WOULD YOU BE WILLING TO FURNISH COST INFORMATION (Dollar and/or staff hours) ON THE ECONOMIC IMPACT OF CURRENT NRC REGULATIONS OR ANY FUTURE PROPOSED NRC REGULATIONS THAT MAY AFFECT YOU? (NRC regulations permit it to protect confidential commercial or financial—proprietary—information furnished to the agency in confidence)

☐ YES

☐ NO

FOR NRC USE ONLY

TYPE OF FEE

FEE LOG

FEE CATEGORY

COMMENTS

APPROVED BY

AMOUNT RECEIVED

CHECK NUMBER

DATE

June 1985

Application for Material License

Sigma Chemical Co.

5)	Carbon 14	any form	100 Ci
	Hydrogen 3		100 Ci

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Application for Material License

Sigma Chemical Co.

- 6) Purpose for which license will be used.
Distribution of prepacked by product material.

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- 7) The responsibility for Radiation Safety Program is the Radiation Safety Committee.

Paul Spangler, Chairman
Harold Jackson, Radiation Safety Officer

Bill Perry, Secretary V. Chairman
Ronald Zygmunt

Training of Radiation Safety Committee Members

Harold Jackson

Mr. Jackson attended Baylor University where he received, in 1966, a B.A degree in Chemistry and attended graduate school at the University of Missouri. Most of Mr. Jackson's experience with radioactivity has been acquired at Sigma Chemical Company since 1975.

In 1980 he became involved in the operation of the Radiation Safety Program at Sigma. In 1982 he successfully completed a course on radiation safety presented by Texas Nuclear Corporation. At present, Mr. Jackson's responsibilities include Radiation Safety Officer at our DeKalb plant.

Ronald J. Zygmunt

Undergraduate at Lebanon Valley College, 1967, approximately one month lecture course work in physics consisting of atomic physics and radiochemistry.

Attended graduate school at the University of Minnesota, had training session under the supervision of Dr. Ronald E. Barnett, Dept. of Chemistry, on the handling and hazards of radioactivity, especially ^3H , ^{14}C and ^{32}P .

Practical laboratory experience at the University of Minnesota amounted to several days use of a ^{125}I compound in a RIA procedure as part of his doctoral research. Course work at the University between the years 1973 - 1976 included information concerning the effect of radiation on genetic material as a portion of a general biochemistry course and on the use of radioisotopes to label metabolic pathways as course in natural products chemistry.

At Sigma Chemical Co. several hundred hours laboratory experience using 0-5 microcurie amounts of ^3H and ^{14}C in the determination of enzyme activities.

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7) continued

Mr. Zygmunt completed a 4 day course in radiation safety in 1982 at Texas Nuclear Corporation. He has served as radiation supervisor at Sigma for at least 4 years, responsible for approval of radioactive safety procedures and day to day room scheduling and upkeep of radiation laboratory.

Paul Spangler (Chairman - Radiation Safety Committee)

Mr. Spangler received his Bachelor of Arts in chemistry from Kansas State College in 1963 and Master of Science in Organic Chemistry from the same school in 1965. Course work included formal instruction in radioisotope methodology and mathematics and calculation basic to the use and measurement of radioactivity.

Mr. Spangler began his industrial experience under employment for 3 years with Chemagro Corporation, 6 years with Mallinckrodt Nuclear, and 8 years with Pathfinder Laboratories, Inc. including Group Leader, Section Supervisor, Vice President and President.

The experience described above involved multiCurie quantities of Carbon¹⁴ and quantities approaching one Curie of Tritium and other commonly used radioisotopes.

William Perry (Secretary - V. Chairman) Radiation Safety Committee)

Mr. Perry received his Bachelor of Science degree in Chemistry from Carroll College, Wisconsin in 1964. Formal instruction was received in radioisotope methodology, and mathematics and calculations basic to the use and measurement of radioactivity.

Better than 13 years of practical experience has been gained continuously since 1972. Mr. Perry was employed by Mallinckrodt, Inc. as a synthetic radiochemist and in the Radiopharmaceutical Division, Quality Control Dept.

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7) continued

Mr. Perry was employed as a synthetic radiochemist in 1975 and 1976 by Midwest Research Institute. In 1976 Mr. Perry accepted the position of Vice President and synthetic radiochemist at Pathfinder Laboratories, Inc.

This experience has been primarily with multiCurie quantities of Carbon₁₄, and multi-milliCurie quantities of Tritium and beta and gamma emitters typical to the production of radiopharmaceuticals.

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8)

Training, Initial Training

Before an individual is cleared to work in the restricted area he must receive training covering the following points. A written record will be kept to show that the individual received training and understands the subject matter.

- 1) The hazard of radioactive exposure.
- 2) Where and how radioactive material is stored.
- 3) Personal protection from radioactive hazard.
- 4) Function and maintenance of protection equipment.
- 5) Survey instrument and the proper usage.
- 6) Review of 10 CFR applicable sections.
- 7) Instruction to report to RSO any condition which may lead or cause violation of the regulations.
- 8) Notice, instructions and reports to workers as outlined in Parts 19 and 20, 10 CFR.
- 9) General training in department operations and procedures.
- 10) Refresher course held as required, or at least annually.

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9) Facilities and Equipment

The radioactive storage area will be located on the first floor at Sigma-Spruce Distribution Center.

The east, west and north wall are dry wall construction, south is concrete block outside wall. The remainder of the room is used for computer cards and forms.

The restricted area is separated from the storage area with a full height chain link fence as partition. The door will be locked and access restricted to authorized personnel only. The packaged chemicals will be stored in three-door "Tyler Type" cooler. The only equipment anticipated at present is a Geiger Counter, to be operated and calibrated per Manufacturer's directions.

Calibration

The Geiger Counter will be annually calibrated by:

R. M. Wester and Associates, Inc.
3317 Highway 94 North
St. Charles, MO 63301

We believe this is all the equipment required for storage of prepaced ^{14}C and ^3H isotopes.

We do not see the need for any special ventilating requirements in this area.

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ANO. 8509120319

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Radiation Protection Program

(see attached)

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