

UNITED STATES ATOMIC ENERGY COMMISSION
APPLICATION FOR BYPRODUCT MATERIAL LICENSE

INSTRUCTIONS - Complete Items 1 through 16 if this is an initial application or an application for renewal of a license. Information contained in previous applications filed with the Commission with respect to Items 8 through 15 may be incorporated by reference provided references are clear and specific. Use supplemental sheets where necessary. Item 16 must be completed on all applications. Mail two copies to: U.S. Atomic Energy Commission, Washington, D.C., 20545, Attention: Isotopes Branch, Division of Materials Licensing. 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. Include ZIP Code.)		(b) STREET ADDRESS(ES) AT WHICH BYPRODUCT MATERIAL WILL BE USED (If different from 1 (a). Include ZIP Code.)	
Monsanto Company Organic Chemicals Division 1700 South Second Street St. Louis, Missouri 63177		Same as 1(a)	
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.)	
Research Department		Amendment to No. 24-1113-9	
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.)	
Edward M. Emery Research Group Leader Physical Chemistry and Gas Chromatography		Same as 4	
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.)	
A. Hydrogen 3 B. Strontium 90 C. Hydrogen 3 D. Hydrogen 3 E. Nickel 63		A. Same as before B. " C. " D. " E. F&M High Temperature Electron Capture Detector Model 2-6195 containing U.S. Radium Corporation Model LAB 784 Foil. 4 millicuries (two detector cells containing 2 millicuries each).	
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.)			
A. Same as before B. " C. " D. To be used in an F&M Scientific Model 810 or 5750 gas chromatography unit. E. To be used in an F&M Scientific Model 810 or 5750 gas chromatography unit.			

(Continued on reverse side)

TRAINING AND EXPERIENCE OF EACH INDIVIDUAL NAMED IN ITEM 4 (Use supplemental sheets if necessary.)					
B. TYPE OF TRAINING	WHERE TRAINED	DURATION OF TRAINING	ON THE JOB (Circle answer)	FORMAL COURSE (Circle answer)	
a. Principles and practices of radiation protection	Barber-Colman, Perkin-Elmer and F&M Instructions on care of ionization and electron capture detectors.	3 mos.	Yes No	Yes No	
b. Radioactivity measurement standardization and monitoring techniques and instruments	Isotopes Lab, Univ. of Colorado		Yes <input checked="" type="radio"/> No <input type="radio"/>	Yes <input type="radio"/> No <input checked="" type="radio"/>	
c. Mathematics and calculations basic to the use and measurement of radioactivity	Same as (b)		Yes No	Yes No	
d. Biological effects of radiation	None		Yes No	Yes No	
9. EXPERIENCE WITH RADIATION (Actual use of radioisotopes or equivalent experience)					
ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE USE	
10. RADIATION DETECTION INSTRUMENTS (Use supplemental sheets if necessary)					
TYPE OF INSTRUMENTS (Include make and model number of each)	NUMBER AVAILABLE	RADIATION DETECTED	SENSITIVITY RANGE (mr/hr)	WINDOW THICKNESS (mg/cm ²)	USE (Monitoring, surveying, measuring)
Tracerlab, Inc. Model SU-3DTW Basic Rate Meter and Laboratory Monitor with Geiger Tube No. TGC-2	One	Beta	Three ranges: 200 counts/min. 2000 counts/min. 20000 counts/min.	Less than 2 mg/cm ²	Monitoring
11. METHOD, FREQUENCY, AND STANDARDS USED IN CALIBRATING INSTRUMENTS LISTED ABOVE					
Planchet with known solid beta radiation source used monthly.					
12. FILM BADGES, DOSIMETERS, AND BIO-ASSAY PROCEDURES USED. (For film badges, specify method of calibrating and processing, or name of supplier)					
Bio-assay of urine sample for anyone exposed to tritium gas as the result of overheating of a detector will be made by Health Physics Associates Ltd., 6744 North California Ave., Chicago 45, Illinois.					
INFORMATION TO BE SUBMITTED ON ADDITIONAL SHEETS IN DUPLICATE					
13. FACILITIES AND EQUIPMENT. Describe laboratory facilities and remote handling equipment, storage containers, shielding, fume hoods, etc. Explanatory sketch of facility is attached. (Circle answer) Yes No					
14. RADIATION PROTECTION PROGRAM. Describe the radiation protection program including control measures. If application covers sealed sources, submit leak testing procedures where applicable, name, training, and experience of person to perform leak tests, and arrangements for performing initial radiation survey, servicing, maintenance and repair of the source.					
15. WASTE DISPOSAL. If a commercial waste disposal service is employed, specify name of company. Otherwise, submit detailed description of methods which will be used for disposing of radioactive wastes and estimates of the type and amount of activity involved.					
CERTIFICATE (This item must be completed by applicant)					
16. 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 THAT ALL INFORMATION CONTAINED HEREIN, INCLUDING ANY SUPPLEMENTS ATTACHED HERETO, IS TRUE AND CORRECT TO THE BEST OF OUR KNOWLEDGE AND BELIEF.					
Date <u>March 2, 1957</u>				Applicant named in item 1 <u>Monsanto Company</u> By: <u>Edward M. Emery</u> Edward M. Emery Research Group Leader Title of certifying official	
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.					

13. Facilities and Equipment

The company maintains a series of laboratory rooms for research and development work and routine chemical analyses. One area will be set aside in which the foils, referenced in this application, will be utilized. Traffic in and out of the laboratory will be kept to a minimum and only persons named in Item 4 of this application will work with the material requested in this application. At present, because of the material requested, no plans have been formulated for any remote handling, equipment storage tanks, shielding or fume hoods normally associated with by-product material. The area will be posted and material will be properly labeled. Temperature-control high-limit devices will be used to prevent excess temperature exposure for the tritium foils.

The effluent gas will be piped into a fume hood or outdoors when operating above 150°C for tritium and at all temperatures for nickel 63.

14. Radiation Protection Program

Tritium Source: Since leak or wipe tests are unnecessary, the condition of the source will be checked semi-annually by measuring the ionization current of the cell under repeatable conditions of carrier gas flow and cell voltage.

Nickel 63 Source: A leak test will be performed at 6-month intervals using the F&M Model P6761 leak test kit.

When the sources are not being used, they will be kept in a locked cabinet.

15. Waste Disposal

No waste is anticipated for the material listed in this application. However, if it is necessary to dispose of one of the sources, it will be returned to the vendor, U. S. Radium Corporation, Radiation Research Corporation, Perkin-Elmer Corporation or F&M Scientific Division, Hewlett-Packard Company.

