NRC FORM 7 (8-2007) 10 CFR 110

U.S. NUCLEAR REGULATORY COMMISSION

APPLICATION FOR NRC EXPORT/IMPORT LICENSE, AMENDMENT, OR RENEWAL

(See Instructions on Page 5)

APPROVED BY OMB: NO. 3150-0027 EXPIRES: 06/30/2009

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PART A FOR NRC USE ONLY		DATE RECEIVED
LICENSE NUMBER XMAT 410	DOCKET NUMBER 11005754	CONTROL/ACCESSION NUMBER

PART B. TO BE COMPLETED FOR ALL LICENSES, AMENDMENTS, RENEWALS OR NOTIFICATIONS

(If more space is needed to complete any of the items, use Pages 3-4 first, and then attach additional sheets, if necessary.)

1. NAME AND ADDRESS OF APPLICANT/LICENSEE	1a. NAME OF APPLICANT'S CONTACT	1b. APPLICANT'S REFERENCE NUMBER
Sigma-Aldrich Corp. and subsidiaries 6000 North Teutonia Avenue Milwaukee, WI 53209	Jim Sanders	None
	1c. PHONE NUMBER (414) 438-3850	1d. FAX NUMBER (414) 438-4235
	1e. E-MAIL ADDRESS jim.sanders@sial.com	

2. TYPE OF ACTION REQUESTED *(Check One)*

- [x] EXPORT (Parts B, C, E)
- [ ] NOTIFICATION OF EXPORT OF INCIDENTAL RADIOACTIVE MATERIAL (PART C, E)
- [ ] IMPORT (Parts B, D, E)
- [ ] COMBINED EXPORT/IMPORT (Parts B, C, D, E)
- [ ] AMENDMENT/RENEWAL Existing License Number: _____

3. CONTRACT NUMBER(S)	4. FIRST SHIPMENT DATE	5. LAST SHIPMENT DATE	6. PROPOSED EXPIRATION DATE
None	12/01/2008	12/31/2011	12/31/2011

PART C. TO BE COMPLETED FOR EXPORT ONLY OR COMBINED LICENSES, AMENDMENTS, OR RENEWALS

(If more space is needed to complete any of the items, use Pages 3-4 first, and then attach additional sheets, if necessary.)

7. NAME(S) / ADDRESS(ES) OF SUPPLIERS AND/OR OTHER PARTIES TO THE EXPORT	8. NAME(S) / ADDRESS(ES) OF INTERMEDIATE FOREIGN CONSIGNEE(S)	9. NAME(S) / ADDRESS(ES) OF ULTIMATE FOREIGN CONSIGNEE(S)
None	None	Please see foreign consignee information on Page 3
7a. FUNCTION(S) PERFORMED/SERVICE(S) PROVIDED	**8a. INTERMEDIATE USE(S)**	**9a. ULTIMATE END USE(S)**
Information on Page 3	None	Information on Page 3

10. DESCRIPTION OF RADIOACTIVE MATERIALS, SEALED SOURCES, NUCLEAR FACILITIES, EQUIPMENT, OR COMPONENTS; FOR NUCLEAR EQUIPMENT INCLUDE TOTAL DOLLAR VALUE OF EQUIPMENT FOR EXPORT	10a. MAX TOTAL VOLUME / ELEMENT WGT (KG), OR TOTAL ACTIVITY (TBq)	10b. MAX ENRICHMENT OR WGT %	10c. MAX ISOTOPE WGT (KG)
Deuterium in the form of: 1. Deuterated compounds (see attached document for product examples) 2. Deuterium Oxide 3. Deuterium gas	5,000 KG as deuterium	N/A	N/A

11. FOREIGN OBLIGATIONS (BY COUNTRY AND BY PERCENTAGE OF MAXIMUM TOTAL VOLUME)

Deuterium is of Canadian origin (88%) and Indian origin (12%)

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PART D. TO BE COMPLETED FOR IMPORT ONLY, OR COMBINED LICENSES, AMENDMENTS, OR RENEWALS

(If more space is needed to complete any of the items, use Pages 3-4 first, and then attach additional sheets, if necessary.)

12. NAME(S) / ADDRESS(ES) OF FOREIGN SUPPLIERS AND/OR OTHER PARTIES TO IMPORT	13. NAME(S) / ADDRESS(ES) OF INTERMEDIATE CONSIGNEE(S)	14. NAME(S) / ADDRESS(ES) OF ULTIMATE CONSIGNEE(S)
N/A	N/A	N/A

12a. NRC EXPORT LICENSE NUMBER(S) (If applicable)	13a. LICENSE NUMBER(S) / EXPIRATION DATE(S)	14a. LICENSE NUMBER(S) / EXPIRATION DATE(S)
N/A	N/A	N/A
	13b. INTERMEDIATE USE(S)	14b. ULTIMATE END USE(S)
	N/A	N/A

15. DESCRIPTION OF RADIOACTIVE MATERIALS, SEALED SOURCES, NUCLEAR FACILITIES	15a. MAX TOTAL VOLUME / ELEMENT WGT (KG), OR TOTAL ACTIVITY (TBq)	15b. MAX ENRICHMENT OR WGT %	15c. MAX ISOTOPE WGT (KG)
N/A	N/A	N/A	N/A

16. FOREIGN OBLIGATIONS (BY COUNTRY AND BY PERCENTAGE OF MAXIMUM TOTAL VOLUME)
N/A

PART E. TO BE COMPLETED FOR ALL LICENSES, AMENDMENTS, OR RENEWALS

17. ADDITIONAL INFORMATION PROVIDED ON PAGES 3, 4, AND/OR ON SEPARATE SHEETS?	17a. COPIES OF RECIPIENTS' AUTHORIZATIONS PROVIDED?
☑ YES ☐ NO	☐ YES ☑ NO

18. CERTIFICATION: I, the applicant's authorized official, hereby certify that this application is prepared in conformity with Title10, Code of Federal Regulations, and that all information provided is correct to the best of my knowledge.

18a. PRINT NAME AND TITLE OF AUTHORIZED OFFICIAL	18b. SIGNATURE – AUTHORIZED OFFICIAL	18c. DATE
Jim Sanders Compliance Supervisor, Sigma-Aldrich	James A Sanders	10/30/2008

REED 12 08

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ADDITIONAL INFORMATION *(Reference applicable block numbers from page 1 and/or page 2 for each entry)*

ULTIMATE CONSIGNEES IN FOREIGN COUNTRY

(for distribution into the medical, pharmaceutical, chemical and industrial markets for non-nuclear end use.)

1. **Sigma-Aldrich Japan KK**
   2-2-24 Higashi-Shinagawa
   Shinagawa-Ku 140002
   Japan

2. **Taiyo Nippon Sanso Corporation**
   Toyo Bldg, 1-3-26 Koyama
   Shinagawa-Ku
   Tokyo, 1428558
   Japan

3. **Sigma-Aldrich Japan KK**
   368 Oomachi
   Chiba-Ken 272
   Ichikawa
   Japan

Box 7a. Function(s) Performed / Service(s) Provided

Sigma-Aldrich plans to sell the various deuterium compounds to the ultimate consignees above for further distribution into the Japanese medical, pharmaceutical, chemical and industrial markets. The consignee's customers in Japan typically use these materials in relatively small quantities (i.e. less than 1 kilogram) for scientific research. This type of research may include identification of chemicals in reaction pathways, metabolic studies or environmental analysis.

Most products are sold in prepackaged units (see attached Product Examples); however, some deuterium is sold to Taiyo Nippon Sanso (listed above as one of the Ultimate Foreign Consignees) for subsequent container relabeling and/or packaging changes prior to further distribution in Japan. No material is to be used in any activity related to isotope separation, heavy water production or in the fabrication of nuclear fuel.

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SIGMA-ALDRICH®

sigma-aldrich.com

3050 Spruce Street, St. Louis, MO 63103 USA
Tel: (800) 521-6956 (314) 771-5765 Fax: (800) 325-5052 (314) 771-5757

October 30, 2008

U.S. Nuclear Regulatory Commission
Attn: Deputy Director
Office of International Programs
11555 Rockville Pike
Rockville, Maryland 20852

Dear Mr. Moore:

Sigma-Aldrich is a life science and high-technology company. We have a broad line of organic and biochemical products to serve laboratory and research needs around the world. One of our important lines of research products is the deuterated material used by the medical, pharmaceutical, and chemical industries.

Along with this cover letter, please find a completed, signed original NRC Form 7 (Application for Export License) for Sigma-Aldrich Corporation.

Previously, Sigma-Aldrich was granted a Specific License (XMAT0401) for deuterium exportation to Japan. License XMAT0401 has expired therefore this application is for a new specific license to replace the expired one. Sales of deuterium to our Japanese consignees have risen slightly over the past few years but we have recently experienced an unanticipated increase in demand which has forced us to reevaluate our future export needs as they relate to the NRC Specific License quantity. To supply our consignees with the deuterium they now require over the course of the next three years, we are submitting this application with a higher license quantity.

If you have any questions or require any additional documents or clarification, please contact Sarah Hinkle, the Product Compliance Specialist located at the St. Louis office, by phone at 314-236-8977 or by email at sarah.hinkle@sial.com

Sincerely,

Sarah Hinkle
Product Compliance
Sigma-Aldrich
2838 Olive Blvd
St. Louis, MO 63103
Ph: 314-236-8977
Email: sarah.hinkle@sial.com

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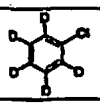
Product Examples

Structure	Name and CAS	Product Number	Packaging	Isotopic Purity	MW	Refractive Index	BP	Density	Each
	Chlorobenzene-d_5 [3114-55-4]	176605	1, 5 g in ampule	99 atom %D	117.60	n20/D 1.522(lit)	130-130.5 C (lit)	1.157 g/ml at 25C (lit)	
$CDCl_3$	Chloroform-d [865-49-6]	151858	10, 50 g in glass bottle	99.96 atom % D	120.38	n20/D 1.444(lit)	60.9 C (lit)	1.500 g/mL at 25C (lit)	
$CDCl_3$	Chloroform-d [865-49-6]	453285	10 x 0.25 mL in ampule	99.96 atom % D	120.38	n20/D 1.444(lit)	60.9 C (lit)	1.500 g/mL at 25C (lit)	
$CDCl_3$	Chloroform-d [865-49-6]	236918	10 x 0.5 in ampule	99.96 atom % D	120.38	n20/D 1.444(lit)	60.9 C (lit)	1.500 g/mL at 25C (lit)	
$CDCl_3$	Chloroform-d [865-49-6]	444731	10 x 0.75 mL in ampule	99.96 atom % D	120.38	n20/D 1.444(lit)	60.9 C (lit)	1.500 g/mL at 25C (lit)	
$CDCl_3$	Chloroform-d [865-49-6]	423092	10 x 1mL in ampule	99.96 atom % D	120.38	n20/D 1.444(lit)	60.9 C (lit)	1.500 g/mL at 25C (lit)	
$CDCl_3$	Chloroform-d [865-49-6]	494275	10, 50 g in ampule	99.96 atom % D	120.38	n20/D 1.444(lit)	60.9 C (lit)	1.500 g/mL at 25C (lit)	
$CDCl_3$	Chloroform-d [865-49-6]	494283	10 x 0.75 mL in ampule	99.96 atom % D	120.38	n20/D 1.444(lit)	60.9 C (lit)	1.500 g/mL at 25C (lit)	
$CDCl_3$	Chloroform-d [865-49-6]	431915	10, 50 mL in ampule	99.96 atom % D	120.38	n20/D 1.444(lit)	60.9 C (lit)	1.500 g/mL at 25C (lit)	
$CDCl_3$	Chloroform-d [865-49-6]	151823	1, 1.5 kg in glass btl 150 g in Sure/Seal™ 250 g in glass btl 50, 100 g in glass btl	99.8 atom % D	120.38	n20/D 1.444(lit)	60.9 C (lit)	1.500 g/mL at 25C (lit)	
$CDCl_3$	Chloroform-d [865-49-6]	522015	10 x 0.6 mL in ampule	99.8 atom % D	120.38	n20/D 1.444(lit)	60.9 C (lit)	1.500 g/mL at 25C (lit)	
$CDCl_3$	Chloroform-d [865-49-6]	441333	10 x 0.75 mL in ampule	99.8 atom % D	120.38	n20/D 1.444(lit)	60.9 C (lit)	1.500 g/mL at 25C (lit)	
$CDCl_3$	Chloroform-d [865-49-6]	236896	5x1, 10x1 mL in ampule	99.8 atom % D	120.38	n20/D 1.444(lit)	60.9 C (lit)	1.500 g/mL at 25C (lit)	
$CDCl_3$	Chloroform-d [865-49-6]	225789	100 g in glass btl 150 g in Sure/Seal™ 500 g in glass btl	99.8 atom % D	120.38	n20/D 1.444(lit)	60.9 C (lit)	1.500 g/mL at 25C (lit)	
$CDCl_3$	Chloroform-d [865-49-6]	423661	10 x 1 mL in ampule	99.8 atom % D	120.38	n20/D 1.444(lit)	60.9 C (lit)	1.500 g/mL at 25C (lit)	
$CDCl_3$	Chloroform-d [865-49-6]	612200	100 g in glass btl	99.8 atom % D	120.38	n20/D 1.444(lit)	60.9 C (lit)	1.500 g/mL at 25C (lit)	
$CDCl_3$	Chloroform-d [865-49-6]	434876	100 g in glass btl 150 g in Sure/Seal™ 500 g in glass btl	99.8 atom % D	120.38	n20/D 1.444(lit)	60.9 C (lit)	1.500 g/mL at 25C (lit)	

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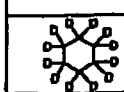
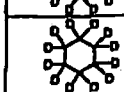
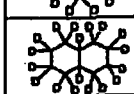
$CDCl_3$	Chloroform-d [865-49-6]	151831	150 g in Sure/Seal™ 250 g in glass btl 50, 100g in glass btl	99.8 atom % D	120.38	n20/D 1.444(lit)	60.9 C (lit)	1.500 g/mL at 25C (lit)	
$CDCl_3$	Chloroform-d [865-49-6]	416754	100, 250 g in glass btl	99.8 atom % D	120.38	n20/D 1.444(lit)	60.9 C (lit)	1.500 g/mL at 25C (lit)	
$CDCl_3$	Chloroform-d [865-49-6]	530735	100, 250 g in glass btl	99.8 atom % D	120.38	n20/D 1.444(lit)	60.9 C (lit)	1.500 g/mL at 25C (lit)	
$CDCl_3$	Chloroform-d [865-49-6]	569569	5x1, 10x1 mL in ampule	99.8 atom % D	120.38	n20/D 1.444(lit)	60.9 C (lit)	1.500 g/mL at 25C (lit)	
$CDCl_3$	Chloroform-d [865-49-6]	570699	50 g in glass btl	99.8 atom % D	120.38	n20/D 1.444(lit)	60.9 C (lit)	1.500 g/mL at 25C (lit)	
	Cyclohexane-d_{12} [1735-17-7]	151866	1, 5, 10 g in ampule	99.6 atom % D	96.23	n20/D 1.421(lit)	80.7 C (lit)	0.893 g/mL at 25C (lit)	
	Cyclohexane-d_{12} [1735-17-7]	269735	10 x 1 mL in ampule	99.6 atom % D	96.23	n20/D 1.421(lit)	80.7 C (lit)	0.893 g/mL at 25C (lit)	
	Decahydronaphthalene-d_{18} [28788-42-3]	217131	1 g in ampule	98.0 atom % D	156.40	n20/D 1.475(lit)	193 C (lit)	1.012 g/mL at 25C	
D_2O	Deuterium oxide [7789-20-0]	191701	10 g in ampule 50 g in glass btl	99.990 atom % D	20.03	n20/D 1.328(lit	101.4 C (lit)	1.107 g/mL at 25C (lit)	
D_2O	Deuterium oxide [7789-20-0]	453366	10 x 0.5 mL in ampule	99.990 atom % D	20.03	n20/D 1.328(lit	101.4 C (lit)	1.107 g/mL at 25C (lit)	
D_2O	Deuterium oxide [7789-20-0]	192341	10, 30 g in serum btl	99.96 atom % D	20.03	n20/D 1.328(lit	101.4 C (lit)	1.107 g/mL at 25C (lit)	
D_2O	Deuterium oxide [7789-20-0]	151890	1, 4 kg in glass btl 10, 50 g in glass btl 125 g in Sure/Seal™ 20 kg in poly drum 250 g in glass btl	99.96 atom % D	20.03	n20/D 1.328(lit	101.4 C (lit)	1.107 g/mL at 25C (lit)	
D_2O	Deuterium oxide [7789-20-0]	269786	10 x 0.5 mL in ampule	99.96 atom % D	20.03	n20/D 1.328(lit	101.4 C (lit)	1.107 g/mL at 25C (lit)	
D_2O	Deuterium oxide [7789-20-0]	441368	10 x 0.75 mL in ampule	99.96 atom % D	20.03	n20/D 1.328(lit	101.4 C (lit)	1.107 g/mL at 25C (lit)	
D—Br	Deuterium bromide [13536-59-9]	486515	5 L in steel cyl	99 atom % D	81.92	Vapor pressure = 334.7 psi (21C)	-67 C (lit)	2.71 (20C, vs air)	
DCl	Deuterium chloride [7698-05-7]	488682	5 L in steel cyl	99 atom % D	37.47	Vapor pressure = 613 psi (21.1C)	-85 C (lit)	1.3 (vs air)	

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