NRC FORM 7 (4-2000) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0027 EXPIRES: 04/30/2003

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APPLICATION FOR LICENSE TO EXPORT NUCLEAR MATERIAL AND EQUIPMENT

(See Instructions on Reverse)

1. APPLICANT'S USE →	a. DATE OF APPLICATION	b. APPLICANT'S REFERENCE	2. NRC USE →		
	4/24/2001	SIAL-Japan		11005266	XMAT0401

3. APPLICANT'S NAME AND ADDRESS RIS

a. NAME: Sigma-Aldrich Corp. and subsidiaries

b. STREET ADDRESS *(Facility Site)*: 3050 Spruce Street

c. CITY: St.Louis | d. STATE: MO | e. ZIP CODE: 63103

f. TELEPHONE NUMBER *(Area Code - Number - Extension)*: (314) 286-8337

4. SUPPLIER'S NAME AND ADDRESS *(Complete if applicant is not supplier)* RIS

a. NAME:

b. STREET ADDRESS:

c. CITY: | d. STATE: | e. ZIP CODE:

5. FIRST SHIPMENT SCHEDULED	6. FINAL SHIPMENT SCHEDULED	7. APPLICANT'S CONTRACTUAL DELIVERY DATE	8. PROPOSED LICENSE EXPIRATION DATE	9. U.S. DEPARTMENT OF ENERGY CONTRACT NO. (if known)
6/1/2001	6/1/2004	As requested	7/30/2004	

10. ULTIMATE FOREIGN CONSIGNEE RIS

a. NAME: See Attached (Applicant Ref# SIAL-Japan)

b. STREET ADDRESS *(Facility Site)*:

c. CITY: | d. COUNTRY:

11. ULTIMATE END USE *(Include plant or facility name)* USE CODE

See Attached (Applicant Ref# SIAL-Japan)

Non-nuclear End-use

11a. DATE REQUIRED

12. INTERMEDIATE FOREIGN CONSIGNEE RIS

a. NAME:

b. STREET ADDRESS *(Facility Site)*:

c. CITY: | d. COUNTRY:

13. INTERMEDIATE END USE USE CODE

13a. DATE REQUIRED

14. INTERMEDIATE FOREIGN CONSIGNEE RIS

a. NAME:

b. STREET ADDRESS *(Facility Site)*:

c. CITY: | d. COUNTRY:

15. INTERMEDIATE END USE USE CODE

15a. DATE REQUIRED

16. COM CODE	17. DESCRIPTION *(Include chemical and physical form of nuclear material; give dollar value of nuclear equipment and components)*	18. MAX. ELEMENT WEIGHT	19. MAX. WT. %	20. MAX. ISOTOPE WEIGHT	21. UNIT
	Deuterium Oxide Deuterium Gas Deuterium Compounds (see example 1 attached)	2500			Kg

22. COUNTRY OF ORIGIN	23. COUNTRY OF ORIGIN – SNM WHERE ENRICH OR PRODUCED	24. COUNTRIES WHICH ATTACH SAFEGUARDS *(if known)*
deuterium oxide: Canada	N/A	

25. ADDITIONAL INFORMATION ON CONSIGNEES, END USES, AND PRODUCT DESCRIPTION *(Use separate sheet if necessary)*

See Attached (Applicant ref# SIAL-Japan)

26. The applicant certifies that this application is prepared in conformity with Title 10, Code of Federal Regulations; and that all information in this application is correct to the best of his/her knowledge.

27. AUTHORIZED OFFICIAL	a. SIGNATURE	b. TITLE
	[signature]	Director of Compliance

SIGMA-ALDRICH
CORPORATION

3050 Spruce Street
Saint Louis, Missouri 63103 USA
Telephone (800)-521-8956 • (314)-771-5765
Fax (800)-325-5052 • (314)-771-5757
email: sig-ald@sial.com
visit us at www.sigma-aldrich.com

NRC Form 7 (4-2000) Attachment
Applicants Reference: SIAL-Japan

Below are explanations of attachment references made on the Sigma-Aldrich application to export deuterium oxide, deuterium (gas) and other deuterium compounds to Japan for non-nuclear end-use.

Box 10a. Ultimate Foreign Consignee

Sigma-Aldrich intends to use the two Ultimate Foreign Consignees identified below.

Distributors:

1) Sigma-Aldrich Japan
368 Oomachi
Chiba-ken 272
Ichikawa, Japan

2) Nippon Sanso Corporation
4-320-1 Tsukagoshi
Saiwai-Ku
Kawasaki 210-8509, Japan

Box 11. Ultimate End Use

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. Their customers in Japan typically use these materials in relatively small quantities (i.e., less than 1 Kg) for scientific research. This type of research may include identification of chemicals in reaction pathways, metabolic studies or environmental analysis.

Most of the products are sold in the prepackaged units, however some heavy water is sold to Nippon Sanso listed above for further labeling of compounds for distribution throughout Japan. No material will be used in any activity related to isotope separation, heavy water production or in the fabrication of nuclear fuel.

Box 25. Additional information on consignees, end uses, and product descriptions

The deuterium oxide is of Canadian origin.
Both consignees have warehouses where final product will be stored. The facilities are secured and monitored.

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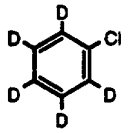
TAK/tk
March 29, 2001



Chlorobenzene-d_5 [3114-55-4]

FW 117.60 bp 130° n_D^{20} 1.5220 d 1.157 Fp 75°F (23°C)
FT-IR 1(2), 1087C *Safety* 2, 738B *R&S* 1(2), 2935A
FLAMMABLE LIQUID *IRRITANT*

Cat. No.	Isotopic Purity %	Name	Size	Pkg Type	Each
17,660-5	99	**Chlorobenzene-d_5**	1g	ampule	$29.65
			5g	ampule	98.80

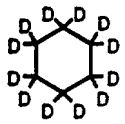
Chloroform-*d* [865-49-6]

$CDCl_3$

FW 120.39 mp -64° bp 60.9° n_D^{20} 1.4445 d 1.500
Beil. 1(3), 63 *FT-NMR* 1(3), 620A *FT-IR* 1(2), 1074D *Safety* 2, 786B
HIGHLY TOXIC *CANCER SUSPECT AGENT*

Cat. No.	Isotopic Purity %	Name	Size	Pkg Type	Each
15,185-8	100.0 (99.96 min)	**Chloroform-*d***	10g	ampule	$20.50
			50g	ampule	68.80
23,691-8	100.0 (99.96 min)	**Chloroform-*d***	10 x 0.5mL	ampule	24.90
44,473-1	100.0 (99.96 min)	**Chloroform-*d***	10 x 0.75mL	ampule	30.20
42,309-2	100.0 (99.96 min)	**Chloroform-*d***	10 x 1.0mL	ampule	34.45
49,427-5	100.0 (99.96 min)	**Chloroform-*d***	10g	ampule	19.10
		contains 0.03% v/v TMS	50g	ampule	64.25
49,428-3	100.0 (99.96 min)	**Chloroform-*d***	10 x 0.75mL	ampule	30.10
		contains 0.03% v/v TMS			
43,191-5	100.0 (99.96 min)	**Chloroform-*d***	10mL	ampule	31.95
		stabilized with 0.5 wt. % silver wire	50mL	ampule	106.95
15,182-3	99.8	**Chloroform-*d***	50g	screw-cap bottle	14.50
			100g	screw-cap bottle	24.30
			10 x 100g	screw-cap bottle	183.80
			150g	Sure/Seal™ bottle	32.70
			250g	screw-cap bottle	53.40
30,873-0	99.8	**Chloroform-*d***	5 x 0.5mL	ampule	7.00
NEW **52,201-5**	99.8	**Chloroform-*d***	10 x 0.6mL	ampule	7.10
44,133-3	99.8	**Chloroform-*d***	10 x 0.75mL	ampule	8.30
23,689-6	99.8	**Chloroform-*d***	10 x 1.0mL	ampule	11.55
22,578-9	99.8	**Chloroform-*d***	100g	screw-cap bottle	25.30
		contains 0.03% v/v TMS	10 x 100g	screw-cap bottle	197.00
			150g	Sure/Seal™ bottle	33.70
			500g	screw-cap bottle	107.95
42,366-1	99.8	**Chloroform-*d***	10 x 1.0mL	ampule	11.55
		contains 0.03% v/v TMS			
43,487-6	99.8	**Chloroform-*d***	100g	screw-cap bottle	25.10
		contains 0.1% v/v TMS	10 x 100g	screw-cap bottle	194.90
			150g	Sure/Seal™ bottle	33.40
			500g	screw-cap bottle	106.90
15,183-1	99.8	**Chloroform-*d***	50g	screw-cap bottle	15.50
		contains 1% v/v TMS	100g	screw-cap bottle	26.10
			10 x 100g	screw-cap bottle	203.00
			150g	Sure/Seal™ bottle	34.75
			250g	screw-cap bottle	57.30
41,675-4	99.8	**Chloroform-*d***	100g	screw-cap bottle	31.75
		stabilized with 0.5 wt. % silver foil	10 x 100g	screw-cap bottle	285.50
			250g	screw-cap bottle	67.95

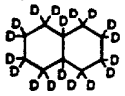
Sure/Seal is a trademark of Sigma-Aldrich Co.



Cyclohexane-d_{12} [1735-17-7]

FW 96.26 bp 78° n_D^{20} 1.421 d 0.893 Fp -1°F (-18°C)
Beil. **5**(3), 36 *FT-NMR* **1**(3), 619A *FT-IR* **1**(2), 1073B *Safety* **2**, 959D
FLAMMABLE LIQUID IRRITANT

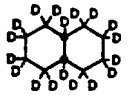
Cat. No.	Isotopic Purity %	Name	Size	Pkg Type	Each
15,186-6	99.6	**Cyclohexane-d_{12}**	1g	ampule	$22.15
			5g	ampule	81.95
			10g	ampule	131.50
26,973-5	99.6	**Cyclohexane-d_{12}**	10 x 1.0mL	ampule	162.15



Decahydronaphthalene-d_{18} [28788-42-3]

FW 156.40 bp 70-71°/13mm n_D^{20} 1.4750 d 1.014 Fp 135°F (57°C)
FT-IR **1**(2), 1073C *Safety* **2**, 1011D
HYGROSCOPIC IRRITANT

Cat. No.	Isotopic Purity %	Name	Size	Pkg Type	Each
NEW **21,713-1**	99	**Decahydronaphthalene-d_{18}** mixture of *cis* and *trans*	1g	ampule	$85.80



cis-Decahydronaphthalene-d_{18} [80997-90-6]

FW 156.40 bp 94-96°/30mm n_D^{20} 1.4761 d 1.015 Fp 137°F (58°C)
FT-IR **1**(2), 1073D *Safety* **2**, 1011C
HYGROSCOPIC IRRITANT

Cat. No.	Isotopic Purity %	Name	Size	Pkg Type	Each
22,679-3	98+	**Decahydronaphthalene-d_{18}**	1g	ampule	$195.25

Deuterium bromide, see Reagents, Acids, Bases and Buffers, page 24

Deuterium chloride, see Reagents, Acids, Bases and Buffers, page 24

D_2O

Deuterium oxide [7789-20-0]

FW 20.03 mp 3.8° bp 101.4° n_D^{20} 1.3280 d 1.107
Merck Index **12**, 2984
HYGROSCOPIC

Cat. No.	Isotopic Purity %	Name	Size	Pkg Type	Each
19,170-1	100.00 (99.990 min)	**Deuterium oxide**	10g	ampule	$60.45
			50g	ampule	152.00
45,335-8	100.00 (99.990 min)	**Deuterium oxide**	10 x 0.25mL	ampule	42.80
45,336-6	100.00 (99.990 min)	**Deuterium oxide**	10 x 0.5mL	ampule	51.40
19,234-1	100.0 (99.96 min)	**Deuterium oxide**	10g	septum bottle	45.80
		low in paramagnetic impurities	30g	septum bottle	125.85
15,189-0	100.0 (99.96 min)	**Deuterium oxide**	10g	screw-cap bottle	28.50
			30 x 10g	screw-cap bottle	354.00
			50g	screw-cap bottle	85.30
			125g	Sure/Seal™ bottle	184.85
			250g	screw-cap bottle	229.65
			1kg	screw-cap bottle	682.05
45,333-1	100.0 (99.96 min)	**Deuterium oxide**	10 x 0.25mL	ampule	17.10
26,978-6	100.0 (99.96 min)	**Deuterium oxide**	10 x 0.5mL	ampule	20.60
44,136-8	100.0 (99.96 min)	**Deuterium oxide**	10 x 0.75mL	ampule	29.00

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April 24, 2001

Deputy Director
Office of International Programs
U.S. Nuclear Regulatory Commission
2120 L. Street, NW
Washington, DC 20037

Dear Deputy Director:

Enclosed is **NRC Form 7, Application for License to Export Nuclear Material.** The license application is to export deuterium oxide, deuterium gas and various deuterium compounds to Japan for Non-nuclear end uses.

Should you have any questions regarding this license application please contact me at 1-800-521-8956 ext. 2710 or (314) 286-8337.

Sincerely,

Timothy A. Klages
Director of Compliance
Sigma-Aldrich Corporation

2001 MAY 21 PM 3:29

TK/tk
04/24/01