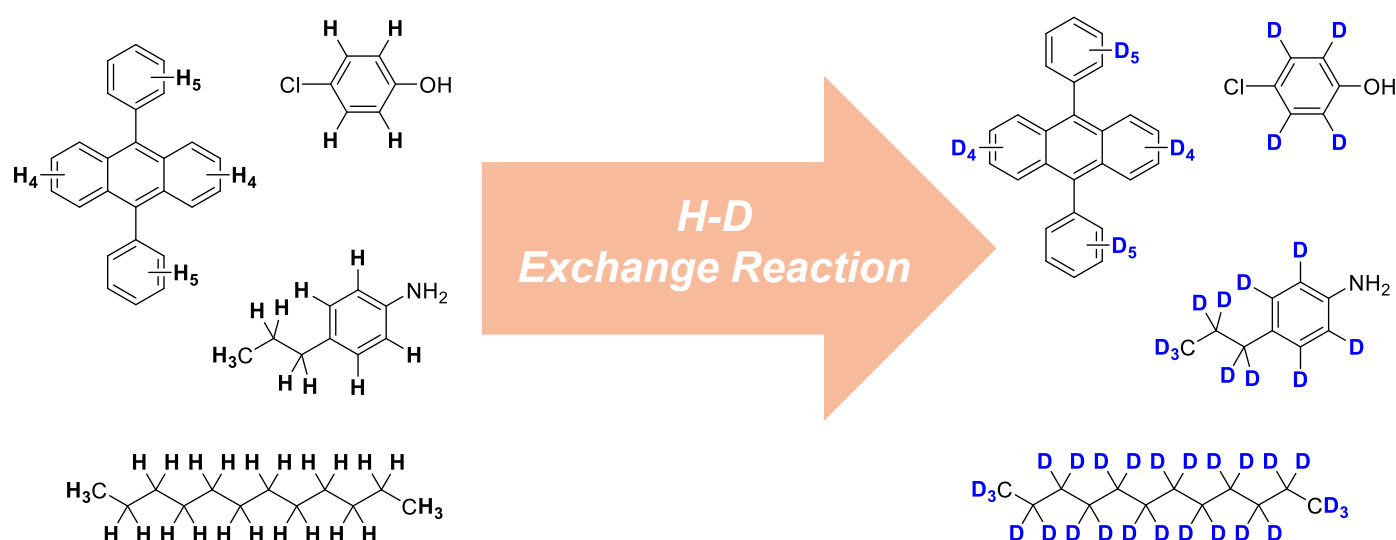


Deuterated Compounds Custom Synthesis

We offer **H-D** Exchange
Custom Synthesis Services



What We Offer

1. Synthesis of deuterated compounds via H-D exchange reactions
2. Subsequent derivatization of deuterated compounds

Deuterium has approximately double the mass of regular hydrogen (protium). Because C–D bonds are stronger than C–H bonds, this property is being actively explored in pharmaceutical and electronic materials research.¹⁻³⁾

<Applications of Deuterated Compounds>

- Pharmacokinetic analysis of drugs
- Trace-level quantitation of pesticide residues in food and endocrine-disrupting substances in the environment
- Higher-order structural analysis of proteins and peptides
- Functional materials such as those used in optical fibers
- Deuterated drugs (also referred to as heavy drugs)
- Organic EL light-emitting materials, etc.

The range of applications for deuterated compounds is expected to continue expanding in the future.

Key properties of deuterium include:

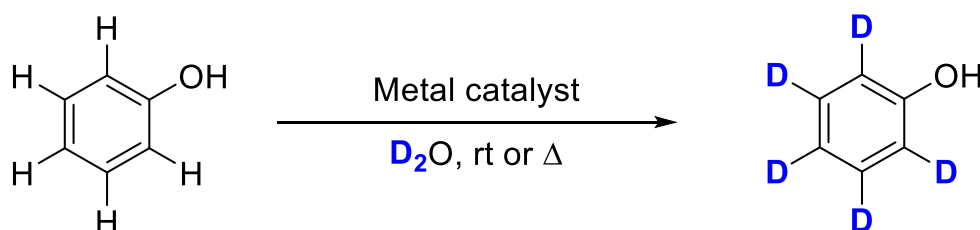
- Approximately double the mass of regular hydrogen (protium)
- Although the natural isotopic abundance is only 0.015%, deuterium is relatively easy to obtain due to the abundance of hydrogen itself
- Readily detectable by NMR, mass spectrometry, and other analytical methods
- A stable, non-radioactive isotope that requires no special facilities or expertise to handle
- Its chemical properties are fundamentally similar to those of protium, although reaction rates are often somewhat slower — a property known as the kinetic isotope effect (deuterium effect)

FUJIFILM Wako offers a selection of deuterated building blocks and reagents for organic synthesis. A **custom synthesis service** is also available for customers seeking deuteration of specific compounds. Utilizing the hydrogen-deuterium exchange technology developed in-house enables the cost-effective and large-scale supply of the desired deuterated compounds.

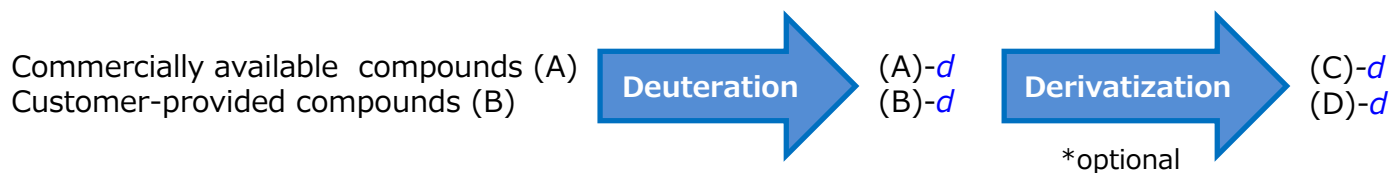
Features of Our Services

- Direct exchange of hydrogen with deuterium in compounds
- Uses deuterium oxide (D₂O), the most cost-effective deuterium source
- Scalable from grams to kilograms; **large-scale production** possible depending on the substrate
- Capable of handling a wide variety of substrates; in particular, we have offered numerous **aromatic compounds**
- We hold **patents for manufacturing methods** tailored to specific substrates

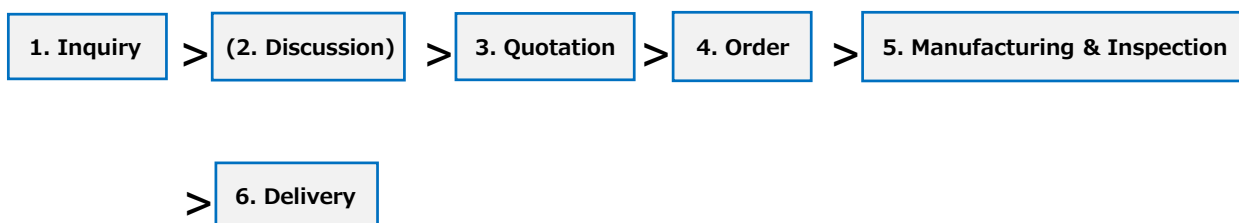
H-D Exchange Reaction Scheme



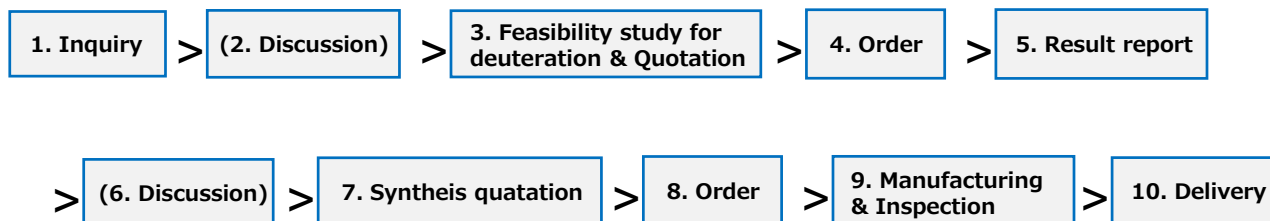
Custom Synthesis Service Flow for Deuterated Compounds



<Compounds we previously synthesized or their analogs>



<Compounds with no previous synthesis record>



*We can sign a Non-Disclosure Agreement (NDA) upon request.

We provide the details of custom synthesis service on our website.

FUJIFILM Wako Home > Synthesis & Materials > Deuterated Compounds/Deuterated-Alkylation Reagents > Deuterated Compounds > Custom Synthesis (Deuterated Compounds)

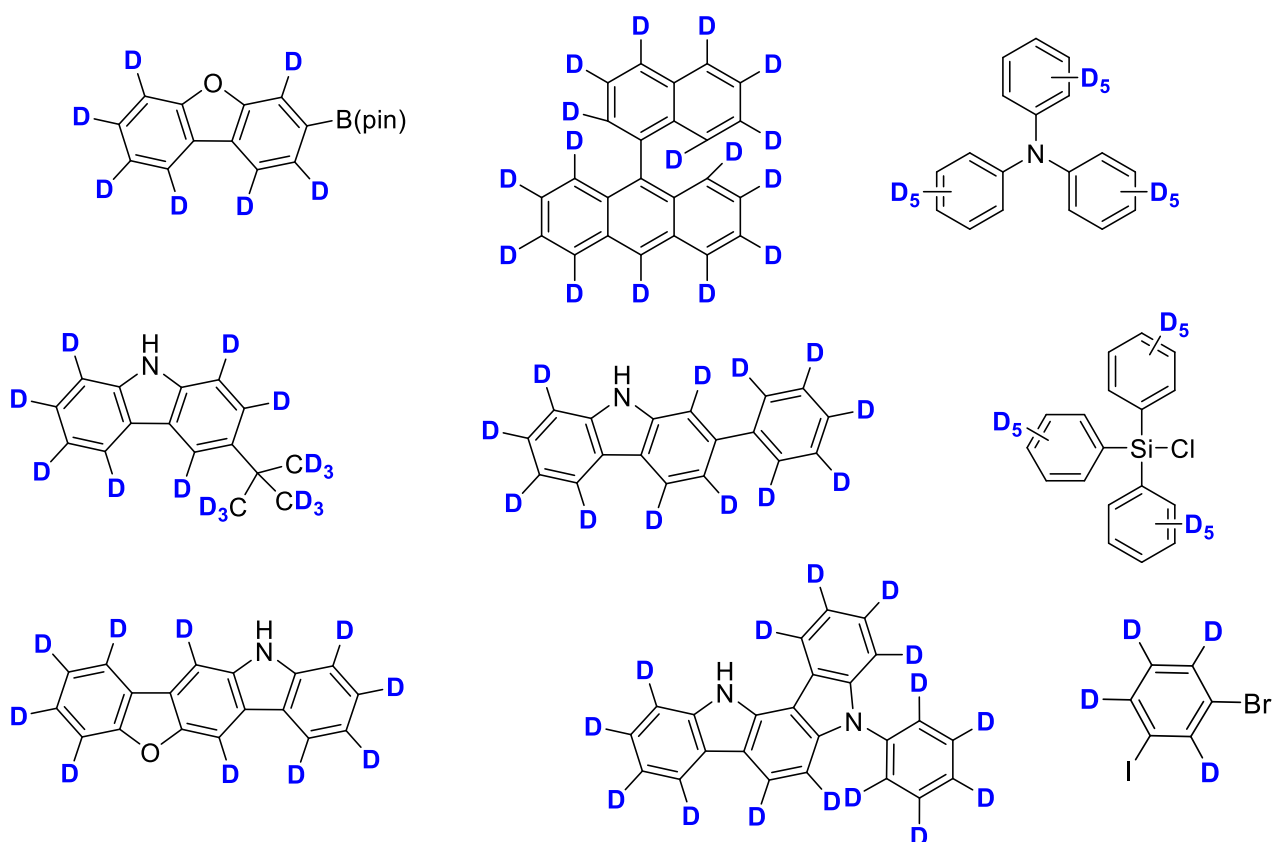


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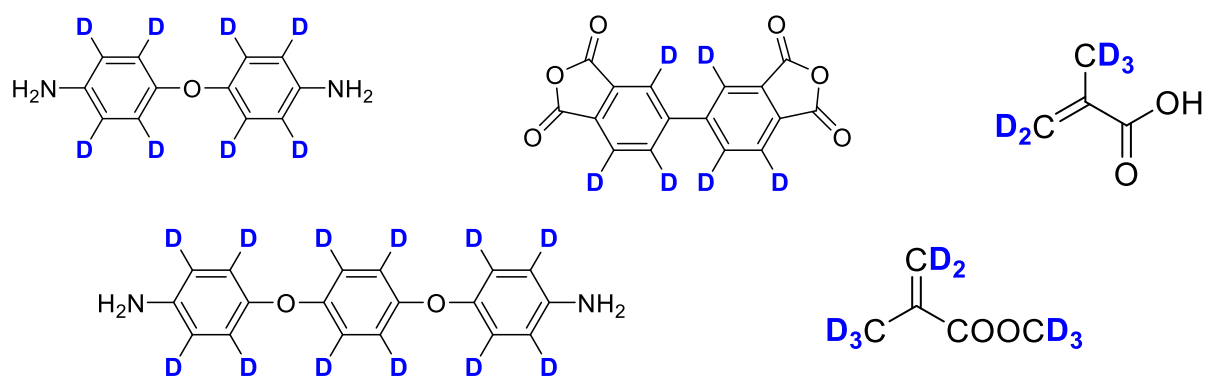
- 1) Sajiki, H. *et al.* : *J. Synth. Org. Chem. Jpn*, **65**, 1179 (2007). (Japanese)
- 2) Sajiki, H. *et al.* : *Chem. Pharm. Bull*, **66**, 21 (2018).
- 3) Sajiki, H. : *Yakugaku Zasshi*, **133**, 1177 (2013). (Japanese)

Examples of Deuterated Compounds

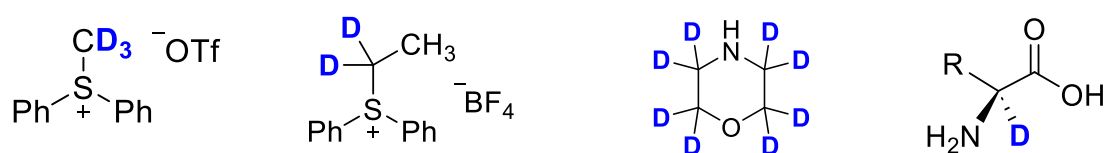
[for Organic EL]



[for optical material]



[for drug research]



Examples of Compounds That Have Been Synthesized

<Aromatic compounds>

<Heteroaromatic compounds>

<Aliphatic compounds>

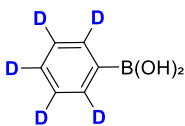
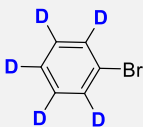
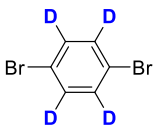
$\text{CD}_3(\text{CD}_2)_6\text{COOH}$	$\text{C}_{15}\text{D}_{30}$ [cyclopentadecane-d ₃₀]			

Product Lineup

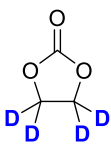
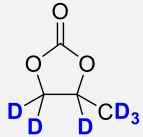
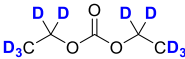
We offer a lineup of general-purpose deuterated compounds.
Bulk orders are also accepted, so please feel free to contact us.

- Deuterated building blocks

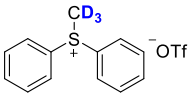
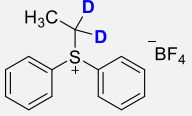
Product No.	Product Name	Structure	Grade	Pkg. Size	Storage Condition
			CAS RN®		
026-19931	1-Bromo-3-iodobenzene-d ₄		for Organic Synthesis	5g	Keep at RT.
			2363787-31-7		
023-19941	1-Bromo-4-iodobenzene-d ₄		for Organic Synthesis	5g	Keep at RT.
			1147565-46-5		
020-19951	4-Bromobiphenyl-d ₉		for Organic Synthesis	5g	Keep at RT.
			142475-00-1		
018-28121	Anthracene-d ₁₀		for Organic Synthesis	1g	Keep at RT.
014-28123			1719-06-8	10g	
022-19771	9-Bromoanthracene-d ₉		for Organic Synthesis	5g	Keep at RT.
			183486-02-4		
046-34791	9,9-Dimethylfluorene-d ₁₄		for Organic Synthesis	5g	Keep at RT.
			-		
033-20971	Carbazole-1,2,3,4,5,6,7,8-d ₈		-	1g	Keep at RT.
039-20973			38537-24-5	10g	
045-34641	Diphenyl-d ₁₀ -amine		for Organic Synthesis	1g	Keep at 2-10 degrees C.
041-34643			37055-51-9	10g	
049-34781	Dibenzofuran-d ₈		for Organic Synthesis	5g	Keep at RT.
			93952-04-6		
016-28281	3-Aminodibenzofuran-d ₇		for Organic Synthesis	5g	Keep at RT.
			-		

Product No.	Product Name	Structure	Grade	Pkg. Size	Storage Condition
			CAS RN®		
167-24521	Phenyl-d ₅ -boronic Acid		for Organic Synthesis	1g	Keep at RT.
163-24523			215527-70-1	5g	
025-17941	Bromobenzene-d ₅		for Organic Synthesis	10g	Keep at RT.
021-17943			4165-57-5	50g	
042-35011	1,4-Dibromobenzene-d ₄		for Organic Synthesis	5g	Keep at RT.
			4165-56-4		

- Deuterated electrolyte solutions

Product No.	Product Name	Structure	Grade	Pkg. Size	Storage Condition
			CAS RN®		
051-08911	Ethylene-d ₄ Carbonate		Battery Grade	250mg	Keep at 2-10 degrees C.
057-08913			362049-63-6	1g	
164-26133	Propylene-d ₆ Carbonate		Battery Grade	1g	Keep at 2-10 degrees C.
			202480-74-8		
044-32293	Diethyl Carbonate-d ₁₀		for Organic Synthesis	5g	Keep at 2-10 degrees C.
			440671-47-6		

- Deuterated alkylation reagents

Product No.	Product Name	Structure	Grade	Pkg. Size	Storage Condition
			CAS RN®		
136-19681	(Methyl-d ₃)-diphenylsulfonium Trifluoromethanesulfonate		for Organic Synthesis	5g	Keep at 2-10 degrees C.
			2251781-86-7		
052-09661	(Ethyl-1,1-d ₂)-diphenylsulfonium Tetrafluoroborate		for Organic Synthesis	5g	Keep at 2-10 degrees C.
			3056531-73-5		
130-19101	Methyl-d ₃ -magnesium Iodide, Diethyl Ether Solution (abt. 1mol/L)	CD_3MgI	for Organic Synthesis	100mL	Keep at RT.
			41251-37-0		