



Training Handout



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INTRODUCTION

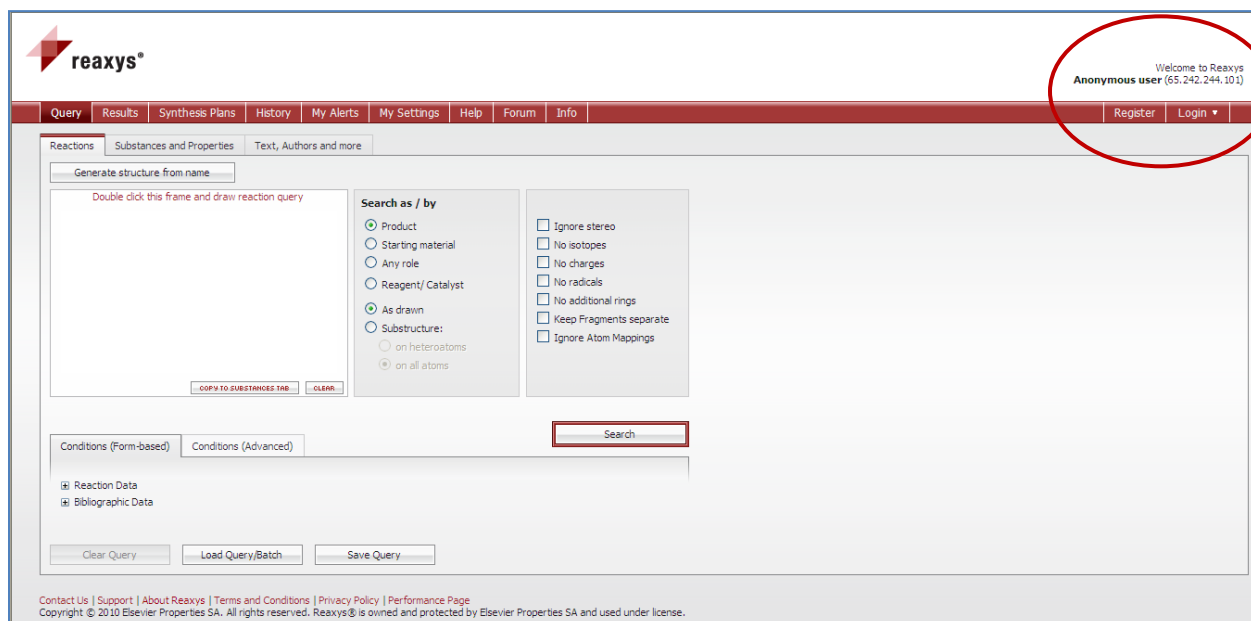
The purpose of this handout is to introduce the basic features of Reaxys. The handout contains exercises comprised of search scenario examples to familiarize users with the system. The goal is to provide a solid foundation enabling users to easily navigate Reaxys for their own research endeavors. Upon completion of the entire manual, users will have a solid foundation towards using Reaxys.

GETTING STARTED

Connect to Reaxys site at <http://www.reaxys.com>

Register for a Username and Password

The first screen you see when you open up Reaxys is the Query page. It indicates that you are logged onto the system as an **Anonymous user** with an IP address in parentheses in the upper right hand corner of your screen. Underneath this label are two buttons indicating where you can Register and Login.



It is recommended that you register for a username and password. Registration is free and with an account you can:

- Save user preferences
- Store queries and results in your History
- Create and manage Alerts relating to your unique research area of interest

To register, click on the Register button and fill in the required fields. You can also sign up to receive product update bulletins and the bi-monthly Reaxys newsletter.

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Welcome to Reaxys
Anonymous user (65.242.244.101)

Query Results Synthesis Plans History My Alerts My Settings Help Forum Info Register Login

Welcome to Reaxys Registration
Registration allows you to personalize Reaxys, save History and create Alerts. Privacy Policy

User Name

Title

First Name

Last Name

Email

Job title

Institution

Location

Password

Confirm password

I wish to sign-up to receive product update bulletins and the bi-monthly Reaxys newsletter.

Register

Registration allows you to personalize Reaxys, save History and create Alerts

You can also sign up to receive product update bulletins and the bi-monthly Reaxys newsletter should you so desire.

Login

Once you have your username and password, click on the login button to sign in.

Welcome to Reaxys
Anonymous user (65.242.244.101)

Register Login

User name: Password:

Remember me on this computer [Forgotten password](#)

[Institution Login](#)

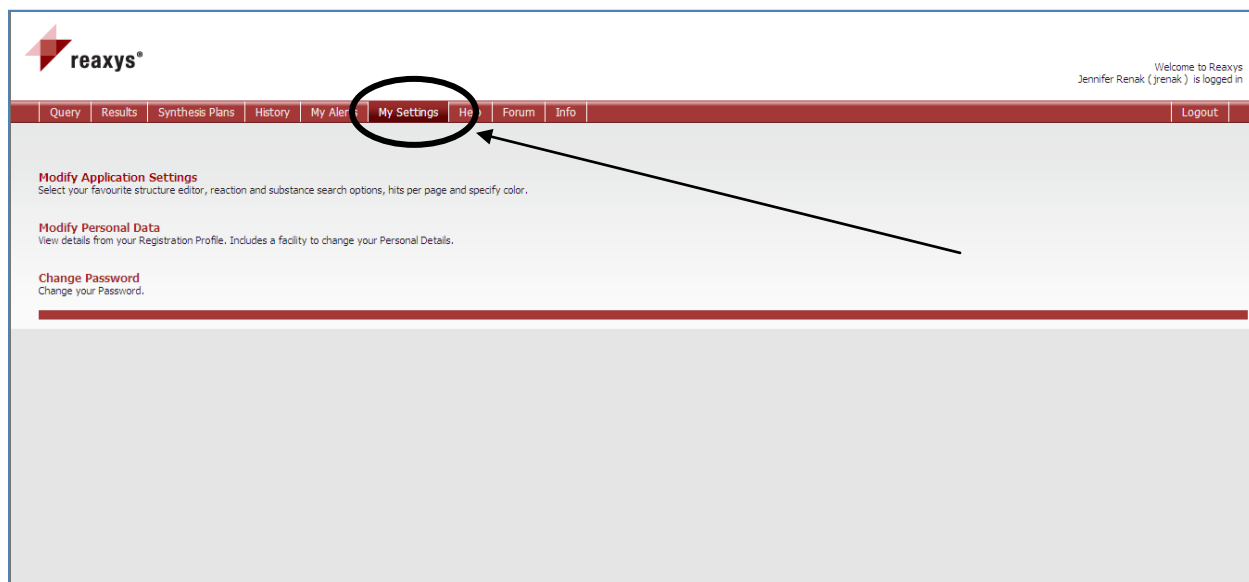
The Anonymous user and IP address tag will be replaced with your name indicating you are signed on to the system.

Welcome to Reaxys
Jennifer Renak (jrenak) is logged in

Logout

My Settings

The first time you log in visit the My Settings page by clicking on the My Settings button. Here you can modify your application settings, modify your personal data, and change your password.



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Welcome to Reaxys
Jennifer Renak (jrenak) is logged in

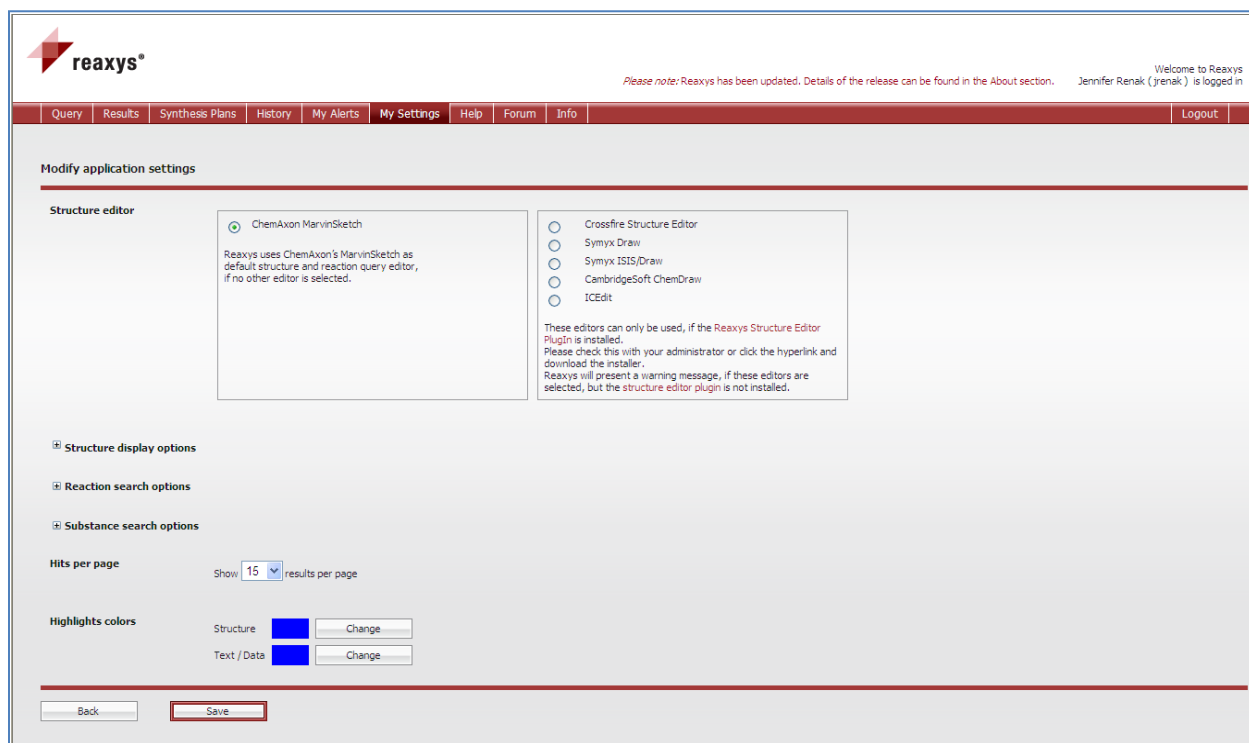
Query Results Synthesis Plans History My Alerts **My Settings** Help Forum Info Logout

Modify Application Settings
Select your favourite structure editor, reaction and substance search options, hits per page and specify color.

Modify Personal Data
View details from your Registration Profile. Includes a facility to change your Personal Details.

Change Password
Change your Password.

Clicking on the **Modify Application Settings** hyperlink allows you to personalize your search options.



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Please note: Reaxys has been updated. Details of the release can be found in the About section. Jennifer Renak (jrenak) is logged in

Query Results Synthesis Plans History My Alerts **My Settings** Help Forum Info Logout

Modify application settings

Structure editor

ChemAxon MarvinSketch
Reaxys uses ChemAxon's MarvinSketch as default structure and reaction query editor, if no other editor is selected.

Crossfire Structure Editor
 Symyx Draw
 Symyx ISIS/Draw
 CambridgeSoft ChemDraw
 ICEdit

These editors can only be used, if the Reaxys Structure Editor Plugin is installed.
Please check this with your administrator or click the hyperlink and download the installer.
Reaxys will present a warning message, if these editors are selected, but the structure editor plugin is not installed.

Structure display options

Reaction search options

Substance search options

Hits per page
Show results per page

Highlights colors

Structure

Text / Data

Structure Editor

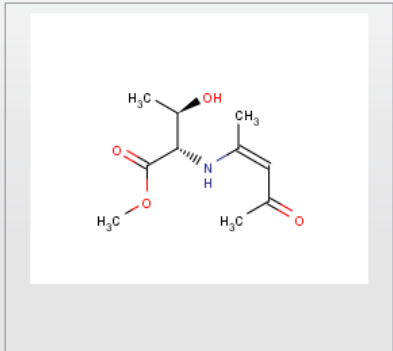
ChemAxon MarvinSketch is the default structure editor in Reaxys. It requires no installation; however it does require a recent version of Java. Five additional structure editors can be used with Reaxys, but require plug ins to work. Plug ins can be found by clicking on the **Reaxys Structure Editor PlugIn** hyperlink.

<p><input checked="" type="radio"/> ChemAxon MarvinSketch</p> <p>Reaxys uses ChemAxon's MarvinSketch as default structure and reaction query editor, if no other editor is selected.</p>	<p><input type="radio"/> Crossfire Structure Editor</p> <p><input type="radio"/> Symyx Draw</p> <p><input type="radio"/> Symyx ISIS/Draw</p> <p><input type="radio"/> CS ChemDraw</p> <p><input type="radio"/> IEdit</p> <p>These editors can only be used, if the Reaxys Structure Editor PlugIn is installed. Please check this with your administrator or click the hyperlink and download the installer.</p> <p>Reaxys will present a warning message, if these editors are selected, but the structure editor plugin is not installed.</p>
--	---

Structure, Reaction, and Substance search options

Structure display options can be set according to your preferences:

Structure display options



Carbon Labels

Always

Never

At straight angles and H atoms

Implicit Hydrogens

On All

On Hetero

On Hetero and Terminal

Off

Display atom numbers

On

Off

R/S Labels

On All


Absolute Stereo

None

E/Z Labels

On

Off



Reaction and substance search options can be set according to your specific areas of research interest. Automatic search expansion features can be disabled here.

The screenshot shows two sections of search options:

- Reaction search options:**
 - Product (selected)
 - Starting material
 - Any role
 - Reagent/ Catalyst
 - As drawn (selected)
 - Substructure:
 - on heteroatoms
 - on all atoms (selected)
 - Ignore stereo
 - No isotopes
 - No charges
 - No radicals
 - No additional rings
 - Keep Fragments separate
 - Ignore Atom Mappings
 - Disable automatic search expansion for reactions
- Substance search options:**
 - As drawn (selected)
 - Substructure:
 - on heteroatoms
 - on all atoms (selected)
 - Ignore stereo
 - No salts
 - No mixtures
 - No isotopes
 - No additional rings
 - Include related Markush
 - Keep Fragments separate
 - No charges
 - No radicals
 - (type values in fields e.g. 3-5)
 - # of Atoms
 - # of Fragments
 - # of Ring Closures
 - Disable automatic search expansion for substances

Hits per page and Highlight colors

The number of hits per page found from your queries can be adjusted by clicking on the drop down arrow. The preferred colors of your hit data can also be adjusted according to your preference.

The screenshot shows the following settings:

- Hits per page:** Show 15 results per page
- Highlights colors:**
 - Structure: Blue (Change button)
 - Text / Data: Blue (Change button)

When you are finished adjusting your preferences be sure to hit save.

A note will appear indicating that your user preferences have been updated. Return to the query page by hitting the Query button on the menu bar.

About Reaxys

The **About Reaxys** hyperlink is on the bottom of the Query page screen.

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Welcome to Reaxys
Jennifer Renak (jrenak) is logged in

Query Results Synthesis Plans History My Alerts My Settings Help Forum Info Logout

Reactions Substances and Properties Text, Authors and more

Generate structure from name

Double click this frame and draw reaction query

Search as / by

- Product
- Starting material
- Any role
- Reagent/ Catalyst
- As drawn
- Substructure:
 - on heterostoms
 - on all atoms

Ignore stereo

No isotopes

No charges

No radicals

No additional rings

Keep Fragments separate

Ignore Atom Mappings

Conditions (Form-based) Conditions (Advanced) Search

Reaction Data

Bibliographic Data

Clear Query Load Query/Batch

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Copyright © 2010 Elsevier B.V. All rights reserved. Reaxys® is owned and protected by Elsevier Properties SA and used under license.

About Reaxys helps keep you abreast of updates within the database

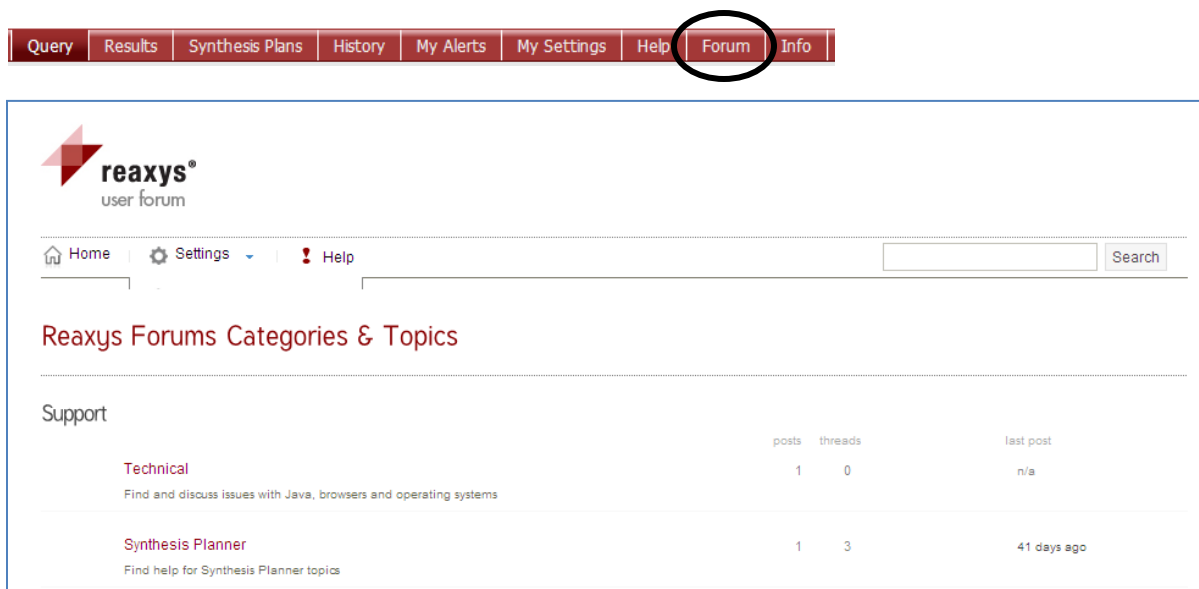
Reaxys is updated every 6 to 8 weeks. Data is continuously added as new publications emerge and suggestions from customers are continuously taken into account. When an update occurs the following tag appears at the top of the Reaxys screen:

Please note: Reaxys has been updated. Details of the release can be found in the About section.

The **About Reaxys** hyperlink will keep you abreast of what changes have taken place.

User Forum

We are always interested in user opinion and encourage you to visit the user forum by clicking on the Forum button on the menu bar.



The screenshot shows the Reaxys user forum interface. At the top, a dark red menu bar contains the following items: Query, Results, Synthesis Plans, History, My Alerts, My Settings, Help, **Forum** (circled in black), and Info. Below the menu bar is the Reaxys user forum header, which includes the Reaxys logo and the text "user forum". The header also features navigation links for Home, Settings, and Help, along with a search bar and a Search button. The main content area is titled "Reaxys Forums Categories & Topics" and lists two categories under the heading "Support":

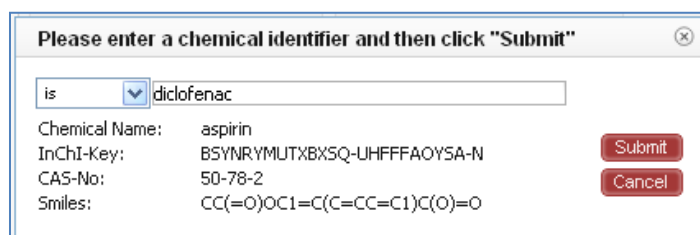
	posts	threads	last post
Technical Find and discuss issues with Java, browsers and operating systems	1	0	n/a
Synthesis Planner Find help for Synthesis Planner topics	1	3	41 days ago

You can ask questions of other users, discuss issues, provide feedback, and share your thoughts and ideas regarding how we can continually improve Reaxys.

Scenario # 1 Diclofenac Reaction product

Analyze diclofenac as a reaction product knowing only the chemical name.

- Click on Query button
- Click on the Reactions Tab
- Click on the Generate structure from name button. This button opens a mini-sub database within Reaxys allowing you to research a chemical structure knowing only the name. CAS numbers, InChi-Keys, and Smiles strings will also work. There are four Boolean options on the drop down arrow to the left. Keep "is" selected and type "diclofenac". Click submit.



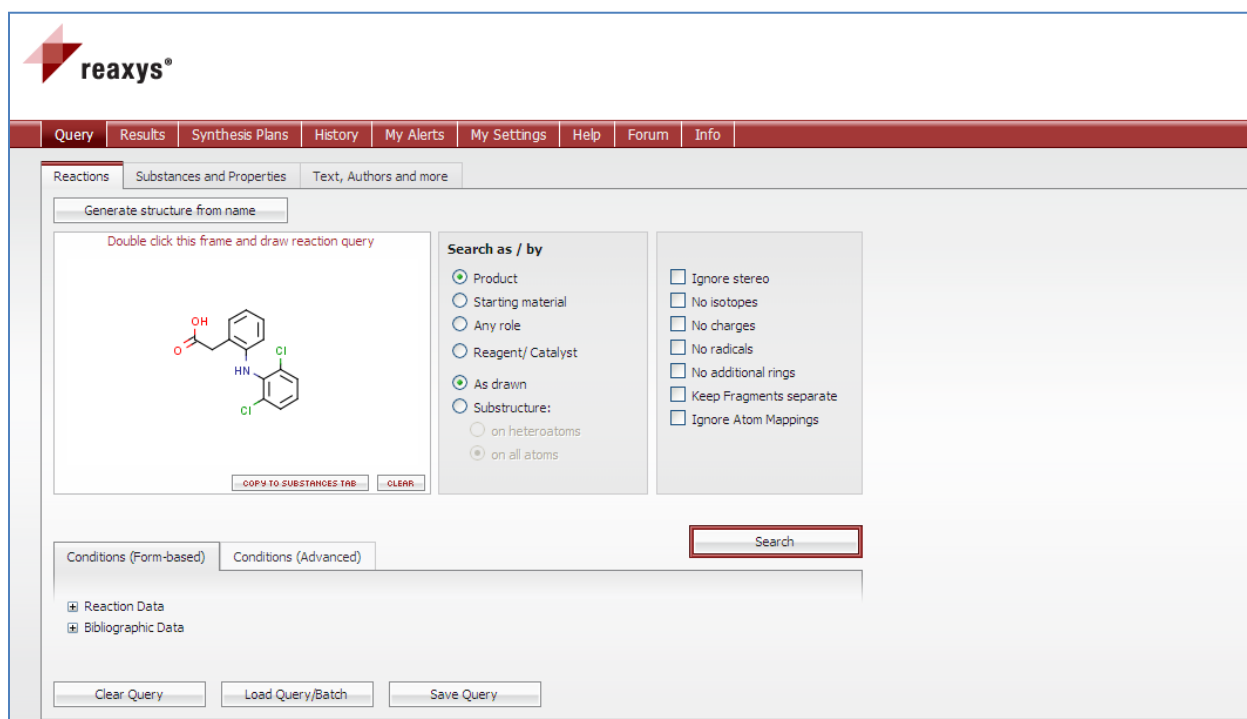
Please enter a chemical identifier and then click "Submit"

is

Chemical Name: aspirin
InChI-Key: BSYNRYMUTXBXSQ-UHFFFAOYSA-N
CAS-No: 50-78-2
Smiles: CC(=O)OC1=C(C=CC=C1)C(O)=O

Submit Cancel

- The diclofenac structure appears in the reaction query window.



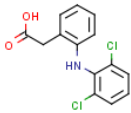
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Query Results Synthesis Plans History My Alerts My Settings Help Forum Info

Reactions Substances and Properties Text, Authors and more

Generate structure from name

Double click this frame and draw reaction query



COPY TO SUBSTANCES TAB CLEAR

Search as / by

Product
 Starting material
 Any role
 Reagent/ Catalyst
 As drawn
 Substructure:
 on heteroatoms
 on all atoms

Ignore stereo
 No isotopes
 No charges
 No radicals
 No additional rings
 Keep Fragments separate
 Ignore Atom Mappings

Conditions (Form-based) Conditions (Advanced)

Reaction Data
Bibliographic Data

Search

Clear Query Load Query/Batch Save Query

- Verify that **Search as / by** has **Product** and **As drawn** selected and there are no further search conditions checked. Click Search.

Results Page

Note: this figure will look slightly different than what Reaxys currently displays due to updates

The screenshot displays the Reaxys interface with the following elements:

- Header:** Reaxys logo, navigation tabs (Query, Results, Synthesis Plans, History, My Alerts, My Settings, Help, Forum, Info), and a user login status (Jennifer Renak (jrenak) is logged in).
- Search Area:** A search bar with a magnifying glass icon and a results preview showing 102 reactions.
- Filter Panel:** A sidebar on the left with various filters such as Sub-structure, Yield, Record Type, Reagent, Solvent, Reaction Type, No. of Steps, Product Availability, and Reactant Availability.
- Reaction List:** A table of results showing chemical structures, yields, conditions, and citations. Red callout boxes highlight specific features: 1 (Query), 2 (102 reactions), 3 (102 reactions out of 68 citations), 4 (Citations tab), 5 (Create Alert), 6 (Reagent filter), 7 (Limit to button), 8 (Yield column), 9 (Rx-ID: 1809974), 10 (Synthesize button), and 11 (Synthesize button).

Yield	Conditions	References
92.9%	With potassium hydroxide in ethanol; water	Ikeda Mohando Co., Ltd. Patent: US4283532 A1, 1981
93%	With sodium hydroxide in ethanol; water	Moser, Peter; Sallmann, Alfred; Wiesenberg, Irmgard Journal of Medicinal Chemistry, 1990, vol. 33, # 9, p. 2358 - 2368
92.3%	With sodium dithionite; water; sodium hydroxide	COSMA S.P.A.; IBSA ISTITUT BIOCHIMIQUE S.A.; AVOGADRI, Alvare; LUSSANA, Massimiliano; PIZZATTI, Enrica; BARETTI, Sergio Patent: WO2010/69397 A1, 2010
85%	With sodium hydroxide in ethanol	Tamura, Yasumitsu; Uenishi, Jun-ichi; Choi, Hong Dae; Haruta, Jun-ichi; Ishibashi, Hiroyuki Chemical & Pharmaceutical Bulletin, 1984, vol. 32, # 5, p. 1995 - 1997

What you see:

1. **Results** button is highlighted indicating that you are in the results window within Reaxys.
2. **Breadcrumb navigation** keeps a summary of all of the actions performed in the results window.
3. **Number of hits retrieved in a specific context:** This number continuously changes as the database updates. (Current 106 as of June 5, 2011)
4. **Reactions and Citations tabs** allows you to see your results as a reaction list with details, or as a reference list.
5. **Create alert** hyperlink creates an email alert notification whenever new information on a query of interest is entered into the database.
6. **Filter by** allows you to filter on various fields to manipulate your results.

7. **Menu bar** at the top of your hit set.



Allows you to check specific result records and limits your results so that you view only those records



Initiates the export process



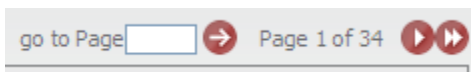
Generates a quick print of exactly what you see on your results screen

8. **Yield, reaction conditions and reference information** is listed for each reaction.
9. **Rx-ID number** is a unique number assigned to each reaction when inputted into Reaxys.
10. **Synthesize** hyperlink launches the synthesis planner tool.
11. **Substance icons** underneath each substance.

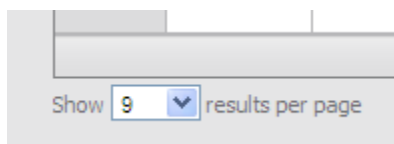
- Substance is commercially available from eMolecules, a free website providing price, supplier and lead time information.
- Substance is commercially available from the Accylrs available chemicals directory on discovery gate. License required for use.
- Icon links to a Hazmat navigator website providing MSDS related information for the substance. License required for use.
- Opens up additional substance information and provides additional search options.
- Allows you to view the molecule in a larger pane and rotate or view in 3D.

Note: Not every substance will contain each icon. The icon is present only when information relating to it is available.

- Scroll down a bit in your results window. A navigation tool appears in the upper right hand corner of the screen. This allows you to scroll through each individual result record, or takes to the bottom or top of the screen.
- Beneath the navigation tool are arrows and a text box allowing you to navigate through different pages of your results.



- If you click to the screen bottom you can see where there is an option for you to change the number of results you see per page. The default setting is 9 results per page.



- Look at your hit set.
- Note the presence of journals and patents together in one results window.
- Note the hyperlinks underneath each reference.
- Click the **Title/Abstract** hyperlink for each reference of hit #5. (Peter Moser paper)
- Note how Reaxys allows you to view the titles and abstracts from journals and patents at the same time in one results window.
- Click on the **Show Experimental Procedure** hyperlink for the patent.
- All experimental procedures for reactions found in patents are excerpted and displayed in the results window. Experimental procedures for 18 Elsevier journals will be available soon in a future releases.

		Synthesize Synthesize RxnID: 1809974 Find similar reactions
93%	With sodium hydroxide in ethanol; water 4 h; Heating;	Moser, Peter; Sallmann, Alfred; Wiesenberg, Irmgard Journal of Medicinal Chemistry, 1990 , vol. 33, # 9, p. 2358 - 2368 Hide Title/Abstract Full Text View citing articles Show Details
Synthesis and Quantitative Structure-Activity Relationships of Diclofenac Analogues The synthesis of a series of 2-anilinothiophenetic acids, close analogues of diclofenac, is described. These compounds were tested in two models used for evaluating the activity of nonsteroidal antiinflammatory drugs (NSAID's), inhibition of cyclooxygenase enzyme activity <i>in vitro</i> , and adjuvant-induced arthritis (ADA) in rats. Statistically significant correlations were found between the inhibitory activities of the compounds in these two models, indicating that cyclooxygenase inhibition seems to be underlying mechanism for the antiinflammatory activity of these compounds. Quantitative structure-activity relationship (QSAR) analysis revealed that the crucial parameters for activity in both models were the lipophilicity and the angle of twist between the two phenyl rings. Optimal activities were associated with halogen or alkyl substituents in both ortho positions of the anilino ring. Compounds with OH groups in addition to two ortho substituents or compounds with only one or no ortho substituents were less active.		
92.3%	With sodium dithionite; water; sodium hydroxide 6 h; Reflux; Hide Experimental Procedure	COSHA S.P.A.; IBSA ISTITUT BIOCHIMIQUE S.A.; AVOGADRI, Alvaro; LUSSANA, Massimiliano; PIZZATTI, Enrica; BARETTI, Sergio Patent: WO2010/69397 A1, 2010 ; Location in patent: Page/Page column 5; Hide Title/Abstract Full Text Show Details
1.a: Example 1(Step a) of preparation of sodium diclofenac: In a four-necked glass flask the following ingredients were charged: - 1-(2,6-dichlorophenyl)-2-indolinone g 592 (M.W. 278.13 moles: 2.128) - Water cc 2368 - Sodium hydrosulfite g 40 - Sodium hydroxide 30 percent g 851 (M.W.: 40; moles: 6.38) The mixture was refluxed for 6 hours, then cooled to 35 - 37 .deg.C. The precipitate was filtered on buchner funnel, then washed with water (cc 1600) preheated to 35-37 .deg.C. Wet 10.16 grams of sodium diclofenac were obtained corresponding to dry 625 grams (Theor. g 677.1)		
PROCESS FOR THE PREPARATION OF DICLOFENAC EPOLAMINE The present invention concerns a process for the preparation of the salt diclofenac epolamine comprising the following steps: a) reacting 1-(2,6-dichlorophenyl)-2-indolinone with a base selected from sodium hydroxide or potassium hydroxide in an aqueous solvent, thus obtaining sodium or potassium diclofenac salt; b) dissolving the so obtained sodium or potassium diclofenac salt in a solvent- mixture comprising water and an organic solvent selected from the group consisting of ethyl acetate, methyl isobutyl ketone, toluene, isobutyl acetate, n-butyl acetate, n-propyl acetate, isopropyl acetate; c) adding a strong acid to give diclofenac acid and removing the water phase; d) anhydriying the remaining organic solvent phase; and e) adding 1-(2-hydroxyethyl)-pyrrolidine.		
85%	With sodium hydroxide in ethanol 3 h; Heating;	Tamura, Yasumitsu; Uenishi, Jun-ichi; Choi, Hong Dae; Haruta, Jun-ichi; Ishibashi, Hiroyuki Chemical & Pharmaceutical Bulletin, 1984 , vol. 32, # 5, p. 1995 - 1997 Hide Title/Abstract Full Text View citing articles Show Details
Synthesis of Diclofenac Diclofenac, a potent antiinflammatory agent, was prepared by acid-catalyzed cyclization of N-(2,6-dichlorophenyl)-o-(methylsulfonyl)acetanilide or of o-chloro-N-(2,6-dichlorophenyl)-o-(methylthio)acetanilide followed by desulfurization and hydrolysis of the resultant 1-(2,6-dichlorophenyl)-3-(methylthio)oxindole. Keywords: acid-catalyzed cyclization of o-(methylsulfonyl)acetanilide; antiinflammatory agent; diclofenac; Friedel-Crafts cyclization of o-chloro-o-(methylthio)acetanilide; oxindole (indolin-2-one).		

- Hide all titles and abstracts and hide the experimental procedure.
- Click on the **View citing articles** hyperlink for the Peter Moser paper of hit #5.
- This allows you to see how many other papers have cited this one reference. You can click to view the full text of these citations if your library subscribes to them.

- Click in the 106 reactions breadcrumb at the top of your results window.
- Click on the **Show details** hyperlink for the Peter Moser paper of hit #5. This brings you to the complete citation record of this reference.

- Click in the 106 reactions breadcrumb at the top of your results window.
- Scroll to the top of your hitset.
- Check off hits 4, 5, and 6 and click Limit to on the menu bar at the top of your hitset.

- Click on the print icon on the menu bar at the top of your hitset. This will allow you to print exactly what is in your results window as you currently see it.

3 reactions out of 5 citations

Reactions Sort by Reaxys-Ranking

Yield	Conditions	References
1		Rx-ID: 2512836
92.9%	With potassium hydroxide in ethanol; water	Ileoda Hokando Co., Ltd. Patent: US4283532 A1, 1981
2		Rx-ID: 1809974
93%	With sodium hydroxide in ethanol; water 4 h; heating;	Hoser, Peter; Sallmann, Alfred; Wiesenberg, Irmgard Journal of Medicinal Chemistry, 1990, vol. 33, # 9 p. 2258 - 2268
92.3%	With sodium dithionite; water; sodium hydroxide 6 h; reflux;	COSHA S.P.A.; IBSA INSTITUT BIOCHIMIQUE S.A.; AVOGADRI, Alvano; LUSSANA, Massimiliano; PIZZETTI, Enrico; BARETTI, Sergio Patent: W02010/09287 A1, 2010 Location in patent: Page/Page column 5
85%	With sodium hydroxide in ethanol 3 h; heating;	Tamura, Yasumitsu; Uenishi, Jun-ichi; Choi, Hong Dae; Haruta, Jun-ichi; Ishibashi, Hiroyuki Chemical & Pharmaceutical Bulletin, 1984, vol. 32, # 5 p. 1993 - 1997
3		Rx-ID: 2510797
<2.5%	With sodium hydroxide; potassium iodide; copper monoxide; potassium carbonate in N,N-dimethyl-formamide	Zenyaku Kogyo Kabushiki Kaisha Patent: US412724 A1, 1963

3 reactions out of 5 citations Page 1 of 1

- Close the Print Version Window
- Click on the **Full Text** hyperlink for a patent.
- This brings you to a window where you can choose to view the patent from Espacenet or the US Patent and Trademark Office.

Reaxys Literature Service - Windows Internet Explorer

http://sc.elsevier.com/xlink?pubno= Live Search

File Edit View Favorites Tools Help Snagit

Reaxys Literature Service

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Reaxys Literature Service

The following document

Patent Number	US4283532
Patent Kind Code	A1
Publication Date	1981

can be obtained from:

Espacenet
US Patent and Trademark Office

Please click the hyperlink of the preferred vendor to get the patent document.

Done Local intranet 100%

- Close the Literature Service Window.
- The **Full Text** hyperlink for the journals will either take you to the full text if your library subscribes to the paper, or brings you to the abstract and provides information regarding where you can access it. Click on **Full Text** for a journal to investigate where it takes you.
- Return to your results window.
- Move your cursor over to the Filter by options on the left side of the screen and click on the drop down arrow for solvent

Filter by:

- Sub-structure
- Yield
- Record Type
- Reagent/Catalyst
- Solvent

by Value | by Group

<input type="checkbox"/>	water	36
<input type="checkbox"/>	ethanol	33
<input type="checkbox"/>	benzene	10
<input type="checkbox"/>	acetic acid	8
<input type="checkbox"/>	tetrachloromethane	6
<input type="checkbox"/>	acetone	6
<input type="checkbox"/>	ethyl acetate	5

More

Limit to Exclude

For each of the filtering parameters you can filter by Group or by Value. The by Group tab is selected by default.

- There are seven different solvents listed with numbers next to them. The numbers indicate how many reactions use that particular solvent. They are sorted by occurrence.
- Click the **More** hyperlink underneath this list. This opens a dialogue box listing all of the solvents that were used in reactions where diclofenac plays the role of product.

Refine on Solvent

Sort by Occurrence

Value	Occurrence	
<input checked="" type="checkbox"/>	water	36
<input checked="" type="checkbox"/>	ethanol	33
<input checked="" type="checkbox"/>	benzene	10
<input type="checkbox"/>	acetic acid	8
<input type="checkbox"/>	tetrachloromethane	6
<input type="checkbox"/>	acetone	6
<input type="checkbox"/>	ethyl acetate	5
<input type="checkbox"/>	dichloromethane	5
<input type="checkbox"/>	phosphate buffer	4
<input type="checkbox"/>	methanol	4
<input type="checkbox"/>	2-methoxy-ethanol	4
<input checked="" type="checkbox"/>	tetrahydrofuran	2
<input type="checkbox"/>	n,n-dimethyl-formamide	2
<input type="checkbox"/>	xylene	1

Limit to Exclude Close

- Check off water, ethanol, benzene, and tetrahydrofuran. Click Limit to.
- Go back to the filtering parameters and click on the drop down arrow for yield.
- Click on the by Value tab and input 75 – 100 as a range. Click limit to.

Filter by:

Sub-structure ▾

Yield ▲

by Value by Group

enter value/range

75-100

More

Limit to Exclude

Record Type ▾

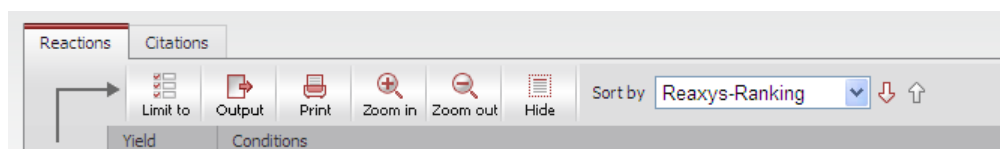
Reagent/Catalyst ▾

Solvent ▾

Reaction Type ▾

No. of Steps ▾

- The results are now limited to 8 reactions that have a yield between 75 and 100 and use water, ethanol, benzene, or tetrahydrofuran as a solvent. Note the breadcrumbs at the top of the results screen.
- Click on the output button on the menu bar above your hits. This begins the export process.



- Leave the Reactions and PDF/print selected.
- Check off the Include following headline box and type *Diclofenac*.
- Leave all remaining parameters as they are and click ok.
- When the output is complete click download.
- A PDF document will open up for viewing.

Reaxys - Windows Internet Explorer

https://www.reaxys.com/reaxys/secured/output.jsp?context=reactions&searchContext=reactions&searchName=H039_5050397530903427087&subContext=fa

reaxys®

Output Reaction Results

Output Reactions Table Reactions Citation Table

to PDF/Print XML Literature Management Systems (e.g. ReferenceManager, EndNote etc.) RD File

Microsoft Word

Microsoft Excel

Include the following headline

Output range All Hits Range:
e.g. 1, 2-5, 10

Output contains

include Structures

include Experimental Procedure

All available data

Identification data only

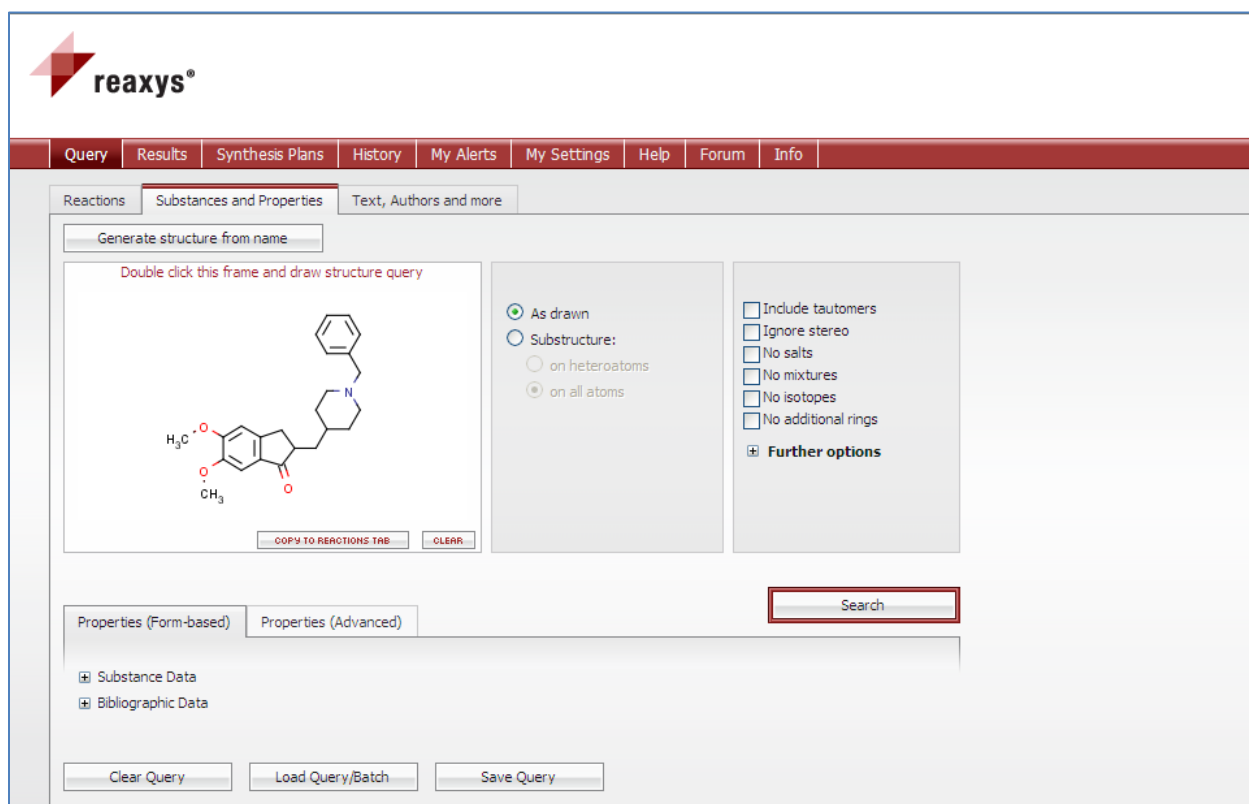
Hit data only

OK Cancel


Scenario #2 – Aricept Derivatives

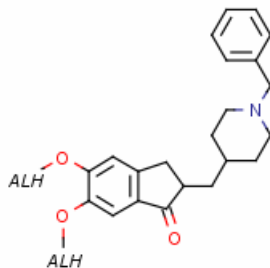
Examine derivatives of the known memory-enhancing drug Aricept. Export the NMR data of promising candidates. Select a molecule to synthesize using the synthesis planner.

- Click on the Query Button
- Click the Substances and Properties tab.
- Click Generate Structure from Name button and enter Aricept. The structure will be displayed:

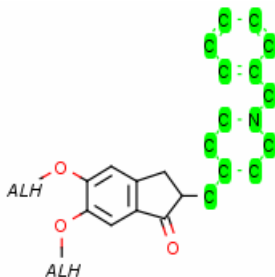


The screenshot shows the Reaxys web interface. At the top, there is a navigation menu with tabs: Query, Results, Synthesis Plans, History, My Alerts, My Settings, Help, Forum, and Info. Below this, there are three sub-tabs: Reactions, Substances and Properties (which is selected), and Text, Authors and more. In the 'Substances and Properties' tab, there is a 'Generate structure from name' input field. Below it, a query window displays the chemical structure of Aricept (donepezil) with the text 'Double click this frame and draw structure query'. To the right of the query window are two columns of options: 'As drawn' (selected), 'Substructure:' (with sub-options 'on heteroatoms' and 'on all atoms'), and a list of checkboxes for 'Include tautomers', 'Ignore stereo', 'No salts', 'No mixtures', 'No isotopes', and 'No additional rings'. Below these is a 'Further options' button. At the bottom of the query window are 'COPY TO REACTIONS TAB' and 'CLEAR' buttons. Below the query window, there are 'Properties (Form-based)' and 'Properties (Advanced)' tabs, a search bar, and checkboxes for 'Substance Data' and 'Bibliographic Data'. At the very bottom, there are 'Clear Query', 'Load Query/Batch', and 'Save Query' buttons.

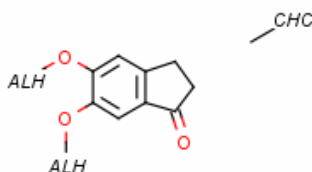
- Double click the substance query window containing Aricept's structure. Aricept will open in MarvinSketch.
- Replace the methyl group on the methoxy groups with the Reaxys Generic ALH. ALH represents either an alkyl group or a Hydrogen. This allows for those groups to have either hydroxyl or alkoxy functionality.
 - Click on the Reaxys Generic icon , select ALH and hit close.
 - Your cursor will have an ALH drag attached.
 - Hover over each methyl group until a blue circle appears.
 - Click your mouse. ALH will now be attached.
 - Click on the lasso button to eliminate the ALH drag.



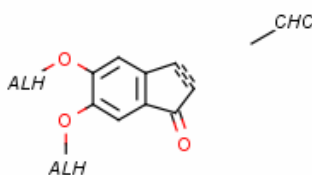
- Highlight the lasso on the menu bar and circle the entire benzyl piperidine heterocyclic group.



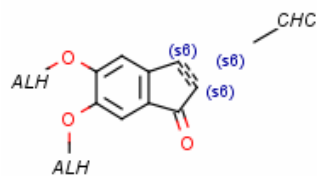
- Click delete.
- Replace that group with a C-CHC fragment where CHC is a Reaxys Generic heterocyclic group. Click your cursor over the single bond button and place this somewhere in the white space near your main molecule. Then click on the Reaxys Generic button again and select CHC. Hit close. The cursor will now have a CHC drag attached. Hover over one end of the ethyl group until a blue circle appears and click your mouse. CHC will now be attached. Click on the lasso button to eliminate the CHC drag.



- Replace the C-C bond in the five membered ring by a query bond allowing it to be either a single or double bond. Hover your cursor over the bond until it is highlighted in blue parentheses. Right click on the bond and to **Edit bond** →type→single or double.



- Open the carbon atoms on either side of the query bond and the carbon on the C-CHC fragment to the maximum level of substitution. Bring your cursor out into the white space of MarvinSketch and type **? s 6** on your keyboard. An **s6** drag will appear with your cursor. Hover over each carbon one at a time and click your mouse. The **(s6)** label will appear next to each atom. The number “6” in this situation is synonymous with “up to the maximum number of atoms that are chemically correct for this atom”.

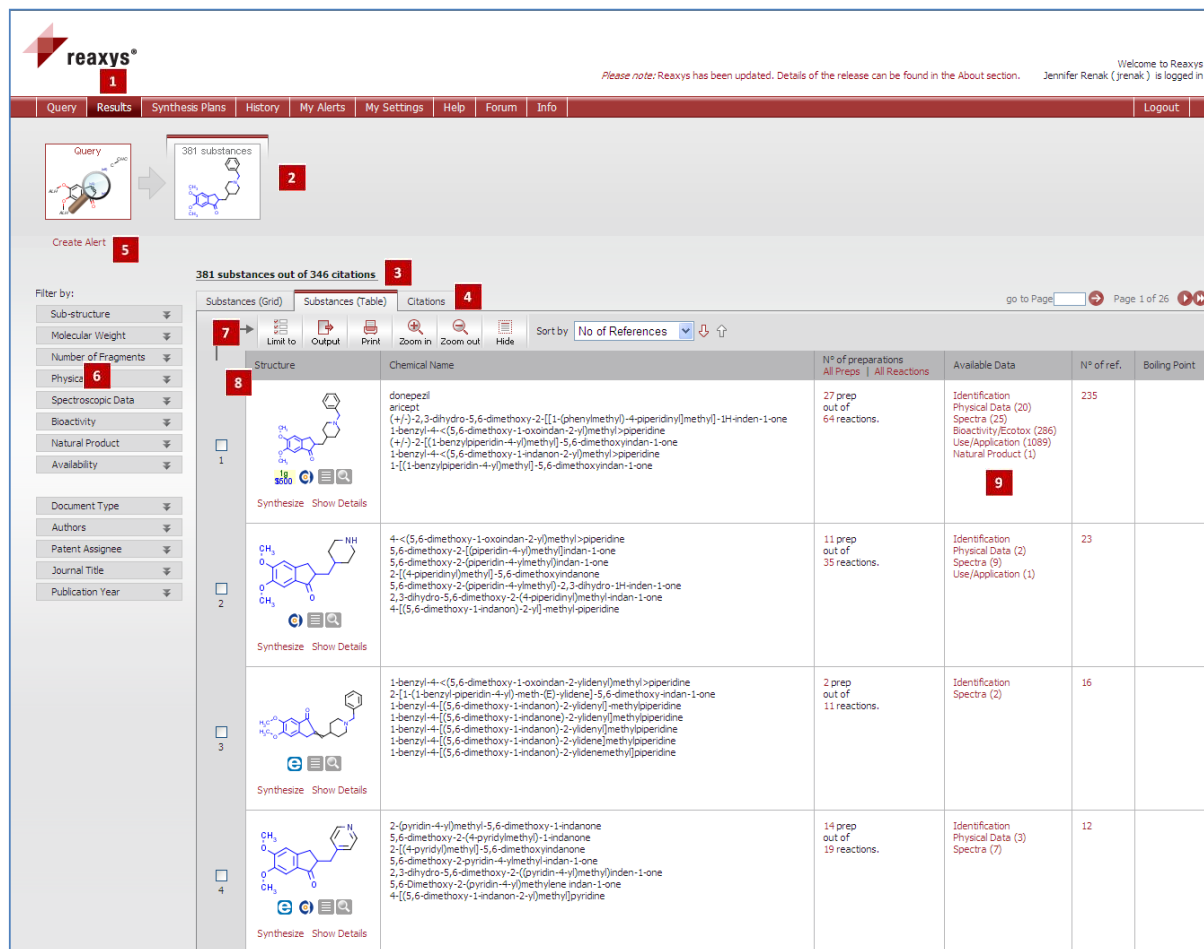


- Click Transfer query on the lower left hand corner of MarvinSketch. This will transfer your query into the Reaxys query page.
- Search **As Drawn**. Check off no salts, mixtures, or isotopes. Click on further options. Check no radicals, and set the number of fragments to 1.

- Click search.

Results Page

(Note: Reaxys has been updated since this booklet was first printed so the number of substances and citations that you see in real time is different from the figures below)



1

2

3

4

5

6

7

8

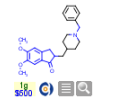
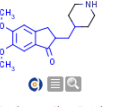
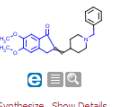
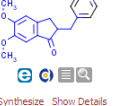
9

381 substances out of 346 citations

Substances (Grid) Substances (Table) Citations

Limit to Output Print Zoom in Zoom out Hide

Sort by No of References

Structure	Chemical Name	N° of preparations All Preps All Reactions	Available Data	N° of ref.	Boiling Point
	donepezil aracet (+)-2,3-dihydro-5,6-dimethoxy-2-[[1-(phenylmethyl)-4-piperidinyl]methyl]-1H-inden-1-one 1-benzyl-4-[(5,6-dimethoxy-1-oxindan-2-yl)methyl]piperidine (+)-2-[[1-benzylpiperidin-4-yl)methyl]-5,6-dimethoxyindan-1-one 1-benzyl-4-[(5,6-dimethoxy-1-indanon-2-yl)methyl]piperidine 1-[[1-benzylpiperidin-4-yl)methyl]-5,6-dimethoxyindan-1-one	27 prep out of 64 reactions.	Identification Physical Data (20) Spectra (25) Bioactivity/ECotox (286) Use/Application (1089) Natural Product (1)	235	
	4-[(5,6-dimethoxy-1-oxindan-2-yl)methyl]piperidine 5,6-dimethoxy-2-[(piperidin-4-yl)methyl]indan-1-one 5,6-dimethoxy-2-(piperidin-4-ylmethyl)indan-1-one 2-[(4-piperidinyl)methyl]-5,6-dimethoxyindanone 5,6-dimethoxy-2-(piperidin-4-ylmethyl)-2,3-dihydro-1H-inden-1-one 2,3-dihydro-5,6-dimethoxy-2-(4-piperidinyl)methylindan-1-one 4-[(5,6-dimethoxy-1-indanon-2-yl)methyl]piperidine	11 prep out of 35 reactions.	Identification Physical Data (2) Spectra (9) Use/Application (1)	23	
	1-benzyl-4-[(5,6-dimethoxy-1-oxindan-2-ylidene)methyl]piperidine 2-[[1-(1-benzylpiperidin-4-yl)methyl]-(E)-ylidene]-5,6-dimethoxyindan-1-one 1-benzyl-4-[(5,6-dimethoxy-1-indanon-2-ylidene)methyl]piperidine 1-benzyl-4-[(5,6-dimethoxy-1-indanon-2-ylidene)methyl]piperidine 1-benzyl-4-[(5,6-dimethoxy-1-indanon-2-ylidene)methyl]piperidine 1-benzyl-4-[(5,6-dimethoxy-1-indanon-2-ylidene)methyl]piperidine 1-benzyl-4-[(5,6-dimethoxy-1-indanon-2-ylidene)methyl]piperidine	2 prep out of 11 reactions.	Identification Spectra (2)	16	
	2-(pyridin-4-yl)methyl-5,6-dimethoxy-1-indanone 5,6-dimethoxy-2-(4-pyridylmethyl)-1-indanone 2-[(4-pyridyl)methyl]-5,6-dimethoxyindanone 5,6-dimethoxy-2-pyridin-4-ylmethylindan-1-one 2,3-dihydro-5,6-dimethoxy-2-(pyridin-4-yl)methylindan-1-one 5,6-dimethoxy-2-(pyridin-4-yl)methylindan-1-one 4-[(5,6-dimethoxy-1-indanon-2-yl)methyl]pyridine	14 prep out of 19 reactions.	Identification Physical Data (3) Spectra (7)	12	

What you see: **Notice what is the same/different as the Reaction Results Pane**

1. **Results** button is highlighted indicating that you are in the results window within Reaxys. - same
2. **Breadcrumb navigation** keeps a summary of all of the actions performed in the results window. - same
3. **Number of hits retrieved in a specific context:** 405 substances out of 355 citations. (This number continuously changes as the database updates). - same
4. **Substances and Citations tabs** allows you to see your results as a substance (grid), a substance (table), or as a reference list. The substance (table) is displayed by default. - different
5. **Create alert** hyperlink - same
6. **Filter by** allows you to filter on various fields to manipulate your results. - same
7. **Menu bar** at the top of your hit set. - same
8. **Substance table columns** – different
9. **Available Data hyperlinks** – different

- Notice that the first hit is Aricept. It has come up as a hit because it fits the search parameters Reaxys was asked to find. In order to focus on derivatives we need to filter.
- Select the drop down arrow for bioactivity, check pharmacological data and then hit exclude.

Filter by:

- Sub-structure
- Molecular Weight
- Number of Fragments
- Physical Data
- Spectroscopic Data
- Bioactivity
 - Pharmacological Data 101
 - Ecotoxicology 1
 - More
 - Limit to
 - Exclude
- Natural Product
- Availability

- Click on the drop down arrow for molecular weight and highlight the **by Value** tab. Type in 250 – 400. Click limit to.

Filter by:

- Sub-structure
- Molecular Weight
 - by Value
 - by Group
 - enter value/range
 - 250-400
 - More
 - Limit to
 - Exclude
- Number of Fragments
- Physical Data
- Spectroscopic Data
- Bioactivity
- Natural Product
- Availability

- Note the breadcrumbs.
- Click on the Substances (Grid) tab to look at the compounds more closely.
- Use the **sort feature** in the results menu bar to sort by commercial availability.

149 substances out of 113 citations

Substances (Grid) Substances (Table) Citations

Limit to Output Print Zoom in Zoom out Sort by No of References

Reaxys-RN
Comm. Availability
Molecular Formula
No of Fragments
Molweight (g/mol)
Publication Year
No of References

- The molecules which contain icons indicating commercial availability are consolidated to the top of the hit set.
- You are interested in substances that have NMR data.
- Click the drop down arrow for Spectroscopic Data. Select NMR spectroscopy. Click Limit to.

Filter by:

Sub-structure

Molecular Weight

Number of Fragments

Physical Data

Spectroscopic Data

NMR 43

Spectroscopy

Mass 38

Spectrometry

IR Spectroscopy 24

UV/VIS 7

Spectroscopy

More

Limit to Exclude

Bioactivity

Natural Product

Availability

- Check off the five substances that are commercially available with NMR data and click Output.

43 substances out of 70 citations

Substances (Grid) Substances (Table) Citations

Limit to Output Print Zoom in Zoom out Sort by Comm. Availability

1 Hit Data (6)
Identification
Physical Data (3)
Spectra (7)

2 Hit Data (4)
Identification
Physical Data (2)
Spectra (9)
Use/Application (1)

3 Hit Data (2)
Identification
Spectra (2)

4 Hit Data (1)
Identification
Physical Data (1)
Spectra (2)
Use/Application (1)

5 Hit Data (3)
Identification
Physical Data (2)
Spectra (5)
Use/Application (1)

6 Hit Data (1)
Identification
Physical Data (1)
Spectra (3)

- Select Substance Details Table.
- Leave PDF selected.
- Check “Include the following headline” and type *Aricept Derivatives with NMR*.
- Change the Output Range to Selected hits.
- Keep Include Structures Checked and Click the Select Data radio button.
- Select NMR Spectroscopy.
- Click OK.

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Output Substance Results

Output Substance Grid Substance Details Table Substance Citations Table

to PDF/Print XML Literature Management Systems (e.g. ReferenceManager, EndNote etc.) RD File

Microsoft Word SD/Mofile

Microsoft Excel Smiles

Include the following headline:

Output range All Hits Selected hits Range:
e.g. 1, 2-5, 10

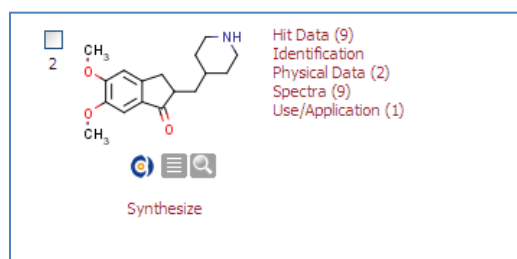
Output contains include Structures All available data Identification data only Hit data only Select data

Please select the facts you want to export from the list below.

<input type="checkbox"/> Spectra	<input type="checkbox"/> Physical Data	<input type="checkbox"/> Use/Application
<input checked="" type="checkbox"/> NMR Spectroscopy (43)	<input type="checkbox"/> Melting Point (18)	<input type="checkbox"/> Use (4)
<input type="checkbox"/> Mass Spectrometry (27)	<input type="checkbox"/> Crystal Property Description (18)	
<input type="checkbox"/> IR Spectroscopy (22)	<input type="checkbox"/> Further Information (1)	
<input type="checkbox"/> UV/VIS Spectroscopy (6)	<input type="checkbox"/> Density of the Crystal (1)	
	<input type="checkbox"/> Space Group (1)	
	<input type="checkbox"/> Crystal System (1)	
	<input type="checkbox"/> Crystal Phase (1)	
	<input type="checkbox"/> Interatomic Distances and Angles (1)	

- When finished click download. A PDF will open for viewing.

- Close the PDF and close the output window.
- Click on the **Synthesize** hyperlink underneath the structure for Hit #2.

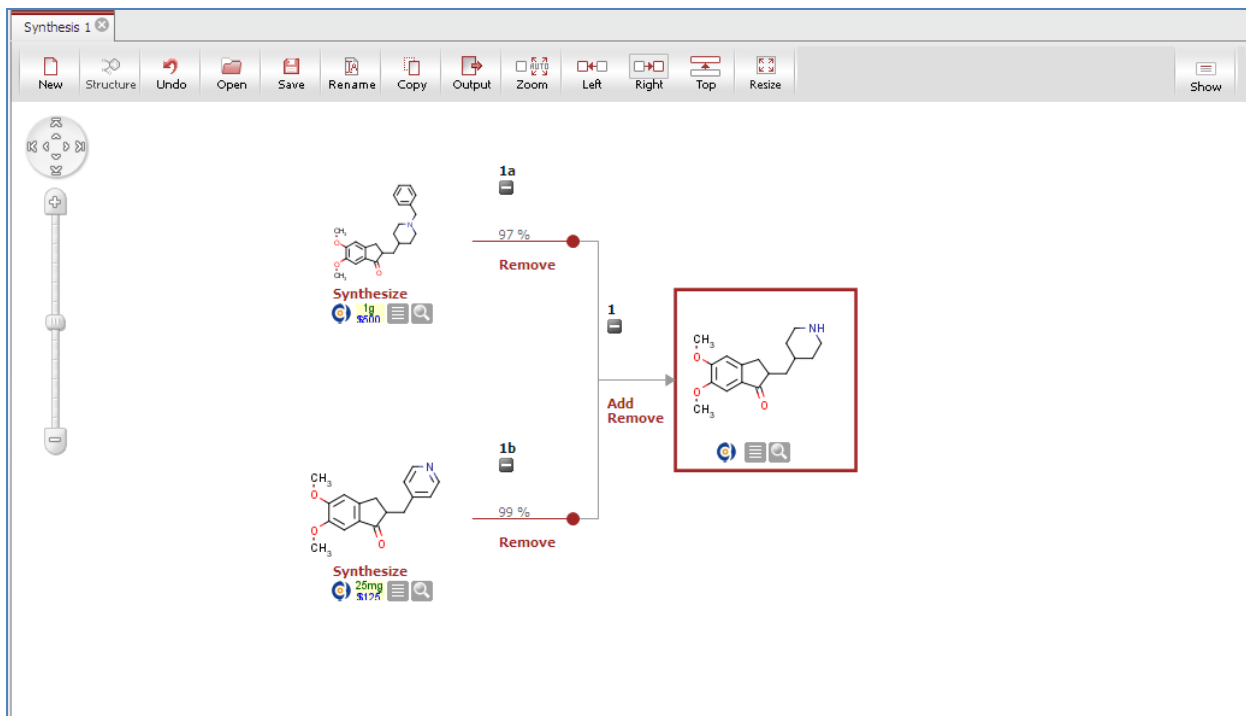


- This opens your Synthesis planner. The Synthesis Planner is an extremely unique feature of Reaxys that helps you to create unique schemes retro synthetically for your molecules and links each synthetic step to the appropriate literature documenting reaction conditions from both journals and patents.
- Your molecule of interest is displayed in the center of the screen and if you scroll down you will see that the different preparations are listed by reaction with the subsequent citations.

Yield	Conditions	References
97%	With ammonium formate; palladium 50percent on activated carbon in methanol T=20°C; 3 h; heating / reflux; Show Experimental Procedure	Reviva Pharmaceuticals, Inc. Patent: US2008133078 A1, 2008 Location in patent: Page/Page column 13; 20; Title/Abstract Full Text Show Details
99%	With hydrogen in methanol; acetic acid T=20°C; P=760.051 Torr; 6 h; Show Experimental Procedure	Campa, Pelayo; Formosa, Xavier; Galdeano, Carlos; Gomez, Tania; Munoz-Torres, Diego; Scarpellini, Hicelle; Vasya, Elisabet; Bado, Albert; Cho, H; Victoria; Camas, Antoni; Pales, Horco; Barfolla, Hannelo; Manoni, Francesca; Andreano, Vincenzo; Estelrich, Joan; Llorondo, Monica; Bilton-Chana, Axel; Luque, F. Javier Journal of Medicinal Chemistry, 2009, vol. 51, # 22, p. 3588-3598 Title/Abstract Full Text View citing articles Show Details
99%	With hydrogen; platinum(IV) oxide in methanol; acetic acid T=20°C; P=760.051 Torr; 6 h; Show Experimental Procedure	USV Limited, MSD HARB. Patent: US6649765 B1, 2003; Location in patent: Page/Page column 3; Title/Abstract Full Text Show Details

- **Experimental procedures** are available for patents as well as **title/abstract** and **full text** information for both journals and patents. Reaction conditions can be filtered.

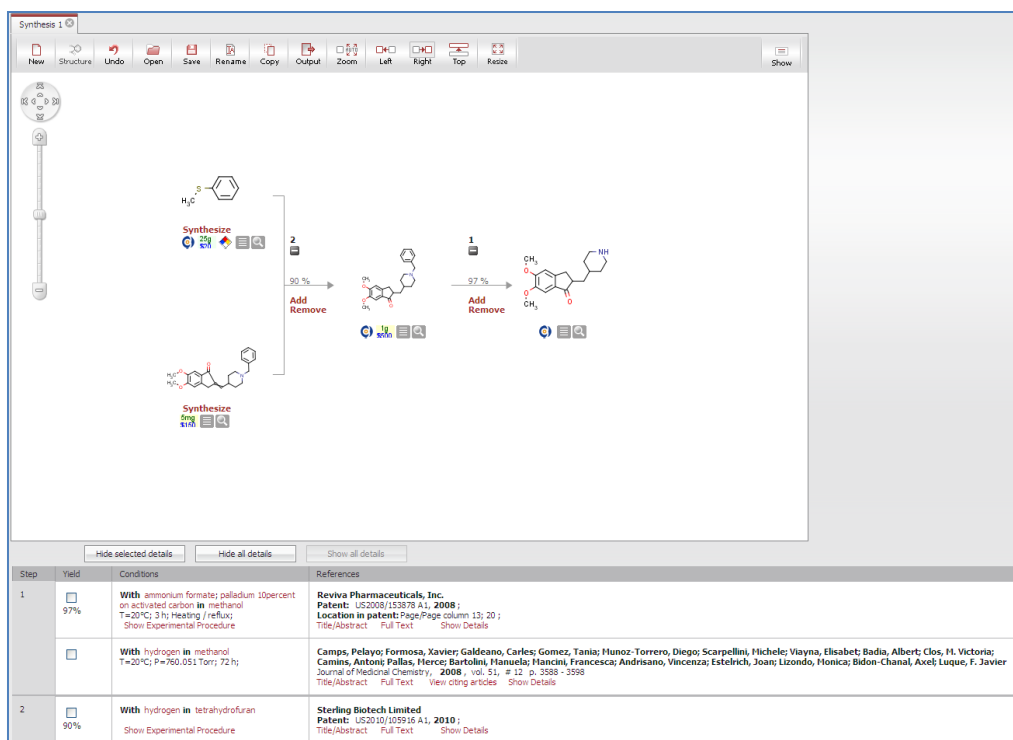
- Check off the first two reactions and click Add Selection. The reactions will be added to your synthetic tree one step up stream of your desired product allowing you to compare different routes.



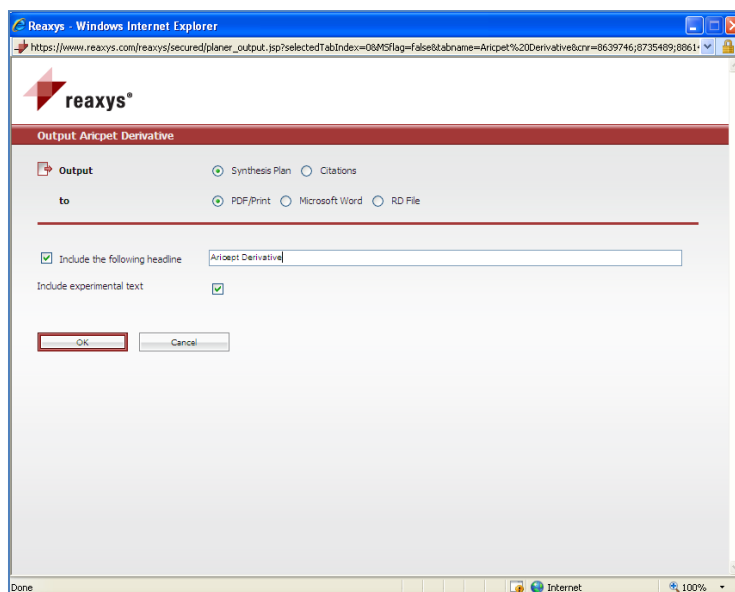
- Click the Synthesize hyperlink underneath the upstream reactant **1a**.
- The box will move from your initial product to the new molecule you are interested in synthesizing.
- A list of reactions will be displayed synthesizing that particular substance.
- Choose a reaction from the list that is populated. If you only select one reaction you don't have to select it and can just click the Add button.
- The reaction will appear one step upstream. The references associated with each reaction appear below your synthesis tree.

Step	Yield	Conditions	References
1a	<input type="checkbox"/> 97%	With ammonium formate; palladium 10percent on activated carbon in methanol T=20°C; 3 h; Heating / reflux; Show Experimental Procedure	Reviva Pharmaceuticals, Inc. Patent: US2008/153678 A1, 2008; Location in patent: Page/Page column 13; 20 ; Title/Abstract Full Text Show Details
	<input type="checkbox"/>	With hydrogen in methanol T=20°C; P=760.051 Torr; 72 h;	Camps, Pelayo; Formosa, Xavier; Galdeano, Carles; Gomez, Tania; Munoz-Torrero, Diego; Scarpellini, Michele; Viayna, Elisabet; Badia, Albert; Clos, M. Victoria; Camins, Antoni; Pallas, Herve; Bartolini, Manuela; Mancini, Francesca; Andrisano, Vincenzo; Estelrich, Joan; Lizondo, Monica; Bidon-Chanal, Axel; Luque, F. Javier <i>Journal of Medicinal Chemistry</i> , 2008, vol. 51, # 12, p. 3558 - 3598 Title/Abstract Full Text View citing articles Show Details
1b	<input type="checkbox"/> 99%	With hydrogen; platinum(IV) oxide in methanol; acetic acid T=20°C; P=2311.54 Torr; 6 h; Show Experimental Procedure	USV Limited, BSD HARG. Patent: US6649765 B1, 2003 ; Location in patent: Page/Page column 3 ; Title/Abstract Full Text Show Details
2	<input type="checkbox"/> 90%	With hydrogen in tetrahydrofuran Show Experimental Procedure	Sterling Biotech Limited Patent: US2010/105916 A1, 2010 ; Title/Abstract Full Text Show Details

- You can continue to retrosynthetically add molecules and compare different synthetic routes connected directly to literature citations.
- If you decide that you do not want to continue with one branch of your synthetic tree the **Remove** Hyperlink will allow you to delete it. Click **Remove** under **1b**.



- Rename the synthesis by clicking on the Rename button within the menu bar. Type *Aricept Derivative*. Synthesis 1 will be replaced with Aricept Derivative.
- Click the Output button on the menu bar. Keep Synthesis plan and PDF/Print selected. Give the plan a headline. Click OK.



Scenario #3 - Bibliographic search on hexavalent chromium

- Click on Query Button
- Click on Text, authors, and more tab
- Type in Hexavalent NEXT chromium

The screenshot shows the Reaxys search interface with the following search criteria:

- Quick Search:** Hexavalent NEXT chromium
- Author(s) Assignee(s):** e.g. Snyder, Peter A. or e.g. Smy*
- Journal Title:** e.g. Journal of Organic Chemistry, e.g. "organic"
- Patent Number:** e.g. US12345678
- Patent Country:** e.g. EP
- Publication Year:** All years (selected), e.g. 2005, e.g. 2000-2008

Buttons at the bottom include: Clear Query, Load Query/Batch, Save Query, and Search.

- Click search
- Look to see the number of citations reactions and substances found.
- Click on the dropdown arrow for **Title/Abstract** for the first three hits.

The screenshot shows the search results page with the following details:

- Query:** 243 citations, No structure
- 243 citations out of 54 reactions and 160 substances**
- Filter by:** Document Type, Authors, Patent Assignee, Journal Title, Publication Year, Yield, Record Type, Reagent/Catalyst, Solvent, Reaction Type, No. of Steps, Molecular Weight, Number of Fragments, Physical Data, Spectroscopic Data, Biocativity, Natural Product
- Table of Results:**

Title of the Document	Authors	Year	Source	Times cited
1 The effect of chromium oxyhydroxide on solid oxide fuel cells	Krumpelt, Michael; Cruse, Terry A.; Ingram, Brian J.; Roubort, Jules L.; Wang, Shanling; et al.	2010	Journal of the Electrochemical Society, 2010, vol. 157, p. B228 - B233 Full Text View citing articles	2
2 Hexavalent chromium removal by waste mycelium of <i>Aspergillus awamori</i>	Gochev, Velizar K.; Velkova, Zdravka I.; Stoytcheva, Marganta S.	2010	Journal of the Serbian Chemical Society, 2010, vol. 75, # 4, p. 551 - 564 Full Text View citing articles	
3 Non-toxic corrosion-protection pigments based on manganese	University of Dayton	2010	Patent: US7789958 B2, 2010; Patent Family: US7789958 B2 Full Text	

Each result includes a **Title/Abstract** section with a brief summary of the document's content.

- Go to Filter by and select journals. Click Limit to.

Filter by:

Document Type ▲

by Value | by Group

journal 224

patent 19

Limit to Exclude

- Click on the Output button.
- Click on Citations table, Literature management systems.
- Leave All hits selected.
- Click OK.

Reaxys - Windows Internet Explorer

https://www.reaxys.com/reaxys/secured/output.jsp?context=citations&searchContext=citations&searchName=H059_9000477780642121969&subContext=fa

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Output Citation Results

Output Citations Table Citation Reactions Table Citation Substances Grid Citation Substances Table

to PDF/Print XML Microsoft Word Microsoft Excel

Literature Management Systems (e.g. ReferenceManager, EndNote etc.) RD File

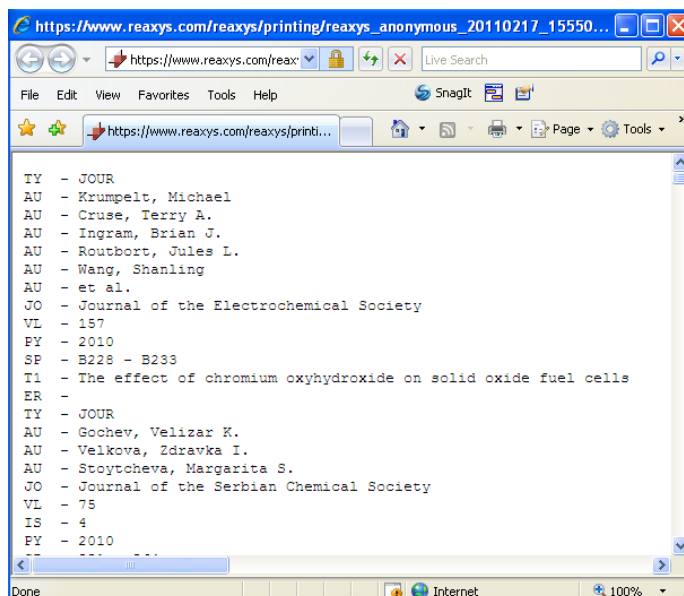
Output range All Hits Range: e.g. 1, 2-5, 10

Output contains include Abstracts

OK Cancel

Done Internet 100%

- A Textbox will open which can be saved and imported into your literature management system of choice






- When reactions and/or substances are associated with a given citation they can also be viewed and expanded to look at more closely.
- For example, after filtering, hit #3 has two substances associated with it.

224 citations out of ... and 113 substances

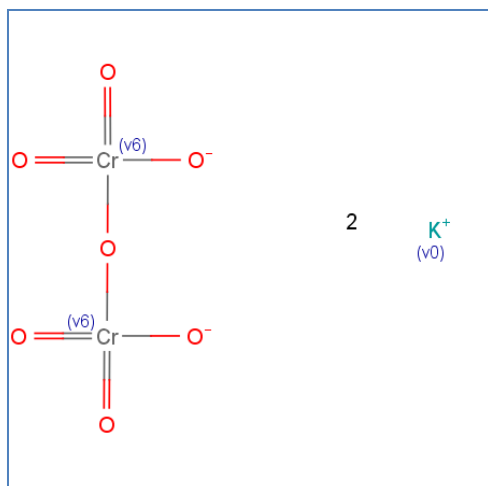
Citations Reactions Substances (Grid) Substances (Table)

go to Page: Page 1 of 25

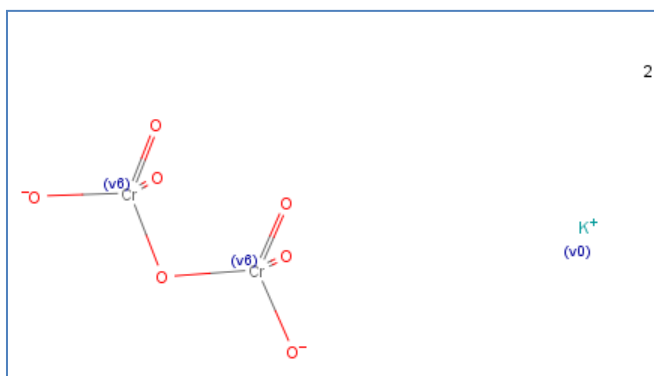
Sort by: Publication Year

	Title of the Document	Authors	Year	Source	Times cited
1	The effect of chromium oxyhydroxide on solid oxide fuel cells	Krumpelt, Michael; Cruse, Terry A.; Ingram, Brian J.; Routbort, Jules L.; Wang, Shanling; et al.	2010	Journal of the Electrochemical Society, 2010, vol. 157, p. B228 - B233 Full Text View citing articles	2
	Title/Abstract Show All Substances (1)				
2	Hexavalent chromium removal by waste mycelium of Aspergillus awamori	Gochev, Velizar K.; Velkova, Zdravka I.; Stoytcheva, Margarita S.	2010	Journal of the Serbian Chemical Society, 2010, vol. 75, # 4, p. 551 - 564 Full Text View citing articles	
	Title/Abstract Show All Substances (2)				
	<chem>CdCl2</chem> 	 			
3	Studying the toxic effect of cadmium and hexavalent chromium on microbial activity of a soil and pure microbe: AAAAAA microcalorimetric method	Yao, J.; Wang, F.; Tian, L.; Zhou, Y.; Chen, H. L.; et al.	2009	Journal of Thermal Analysis and Calorimetry, 2009, vol. 95, p. 517 - 524 Full Text View citing articles	1
	Title/Abstract Show All Substances (2)				

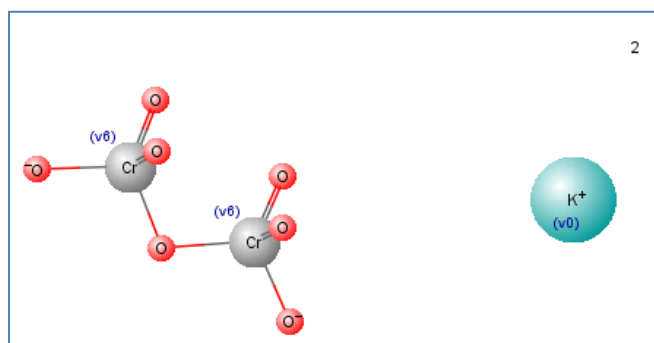
- Potassium dichromate can be zoomed in to look at it more closely by clicking on the magnifying glass. This is useful as a teaching and training tool.



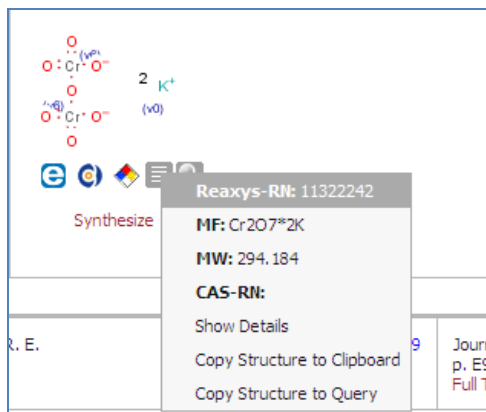
- Right clicking on the window pane and going to Edit → Clean → Clean in 3D changes the molecule conformation.



- Right clicking again and selecting Display → Ball and Stick and then Transform → Zoom allows you to see the molecule in a larger visually different and larger form.



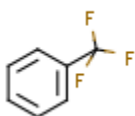
- The gray notebook icon underneath the structure also allows you to copy the structure to a clipboard as a mol file to open it in molecular modeling applications.
- It also allows copies the structure to a query if you want Reaxys to look at the substance more closely.



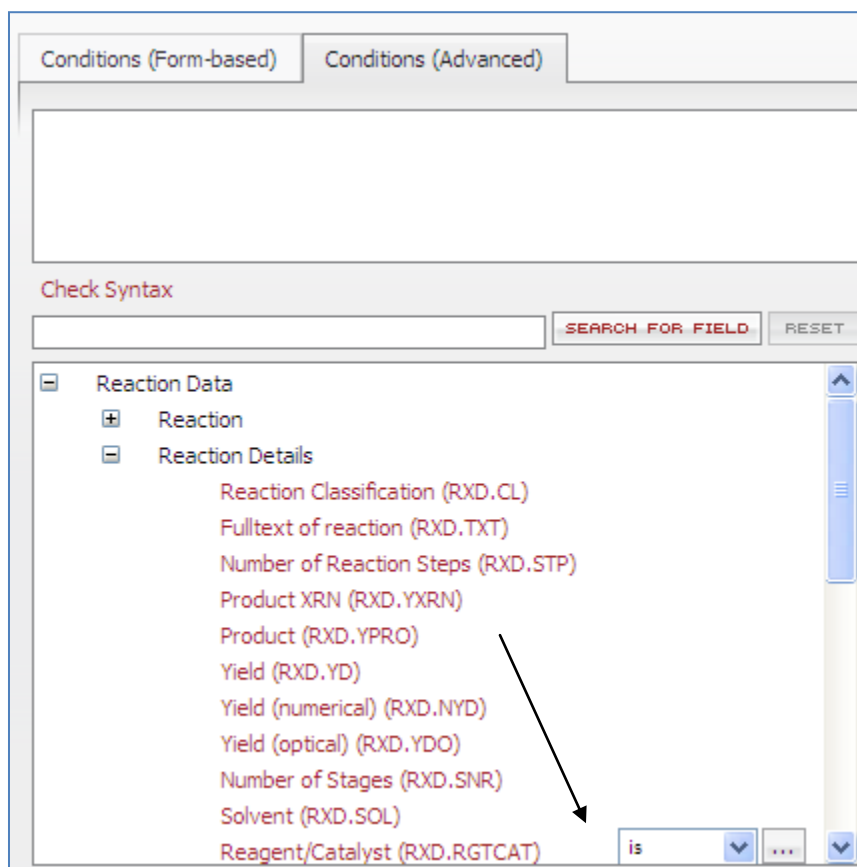
Scenario #4 – Trifluoromethylation Reaction

Find products of trifluoromethylation reaction that use palladium containing catalysts. Limit the list to multi-step reactions. Output a synthetic scheme.

- Go to the Reaction Query tab
- Click Generate Structure from Name. Type trifluoromethylbenzene (use *is* as operator). Click Submit.
- The structure is displayed on the screen.

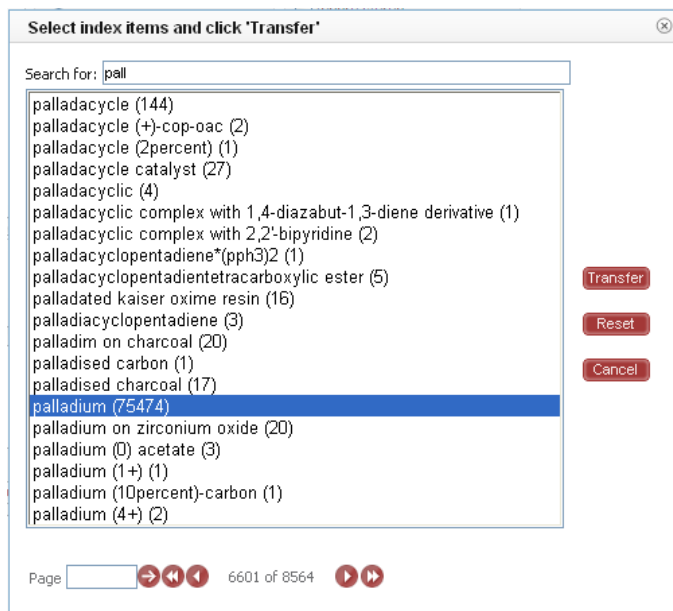


- Go to the Conditions Advanced tab, Reaction Data, Reaction Details, **Reagent/Catalyst (RXD.RGTCAT)**.
- Keep the **is** operator selected and click on the box.

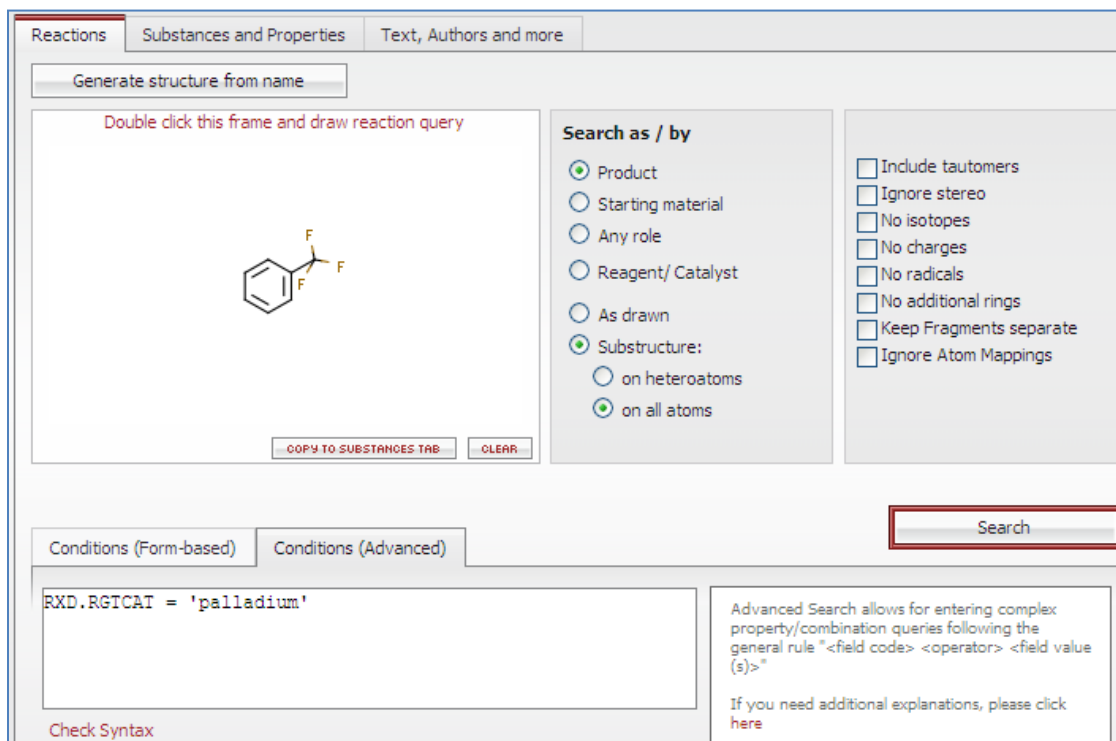


The screenshot displays the 'Conditions (Advanced)' tab in the Reaxys software. The 'Reaction Data' section is expanded to show 'Reaction Details'. The 'Reagent/Catalyst (RXD.RGTCAT)' field is selected, and the operator 'is' is chosen from a dropdown menu. An arrow points to the dropdown menu.

- Type in “pall” for palladium. Then select palladium from the index menu and hit transfer.



- The following syntax will appear: RXD.RGTCAT = 'palladium'. **Search as / by** Product as a substructure on all atoms. Click Search.



- On the Reaction Results tab, you have more than 350 reactions. Some are not trifluoromethylation reactions. To avoid these, filter the reactions by substructure.
- Click the filter by substructure drop down arrow. A box will appear. Click the generate structure from name button. Type trifluoromethylbenzene and click submit. The structure will appear in the box. **Search as/by** starting material. As a substructure on all atoms. Click Exclude.

Filter by Sub-structure

Generate structure from name

Double click this frame and draw reaction query

Cc1ccccc1C(F)(F)F

Search as / by

Product

Starting material

Any role

Reagent/ Catalyst

As drawn

Substructure:

on heteroatoms

on all atoms

Include tautomeres

Ignore stereo

No isotopes

No charges

No radicals

No additional rings

Keep Fragments separate

Ignore Atom Mappings

Copy Structure to Query Copy Structure from Query Limit to Exclude Close

- Over 300 reactions were eliminated. You are interested in multistep reactions where the reactants are known to be available for purchase. Click on the drop down arrow for No. of Steps. Check off the box for 1 and hit exclude.

No. of Steps

by Value by Group

<input checked="" type="checkbox"/>	1	4
<input type="checkbox"/>	2	13
<input type="checkbox"/>	3	10
<input type="checkbox"/>	4	11
<input type="checkbox"/>	5	5
<input type="checkbox"/>	6	4
<input type="checkbox"/>	7	1

Limit to Exclude

- Click the drop down arrow on the Filter By Reactant availability and check all reacts available for purchase. Click Limit to.

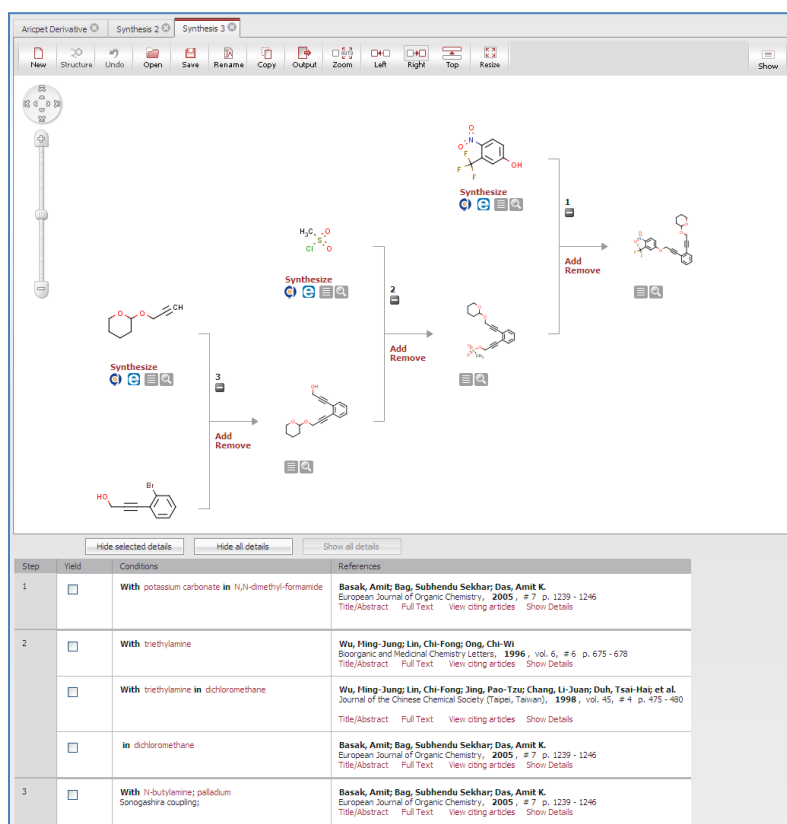
Reactant Availability

by Value by Group

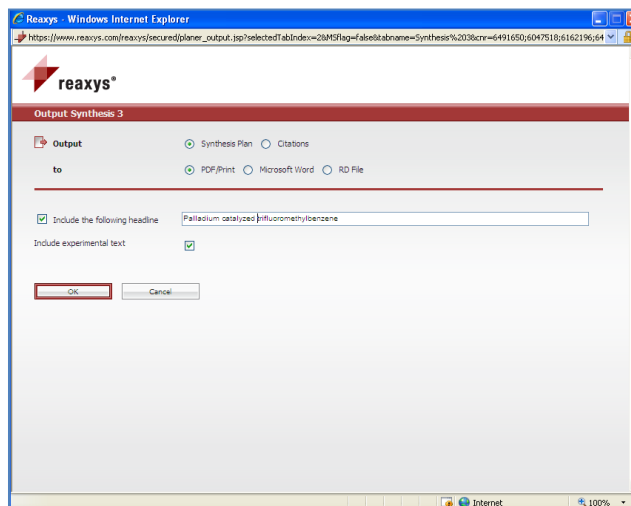
<input type="checkbox"/>	all reacts prep known	22
<input checked="" type="checkbox"/>	all reacts for purchase	21
<input type="checkbox"/>	no prep, no reacts for purchase	1

Limit to Exclude

- You now have more than 20 multi-step reactions with all of the starting materials commercially available.
- Click on View Scheme for the second reaction. The scheme appears in the synthesis planner with all of the steps linked to the relevant citations.



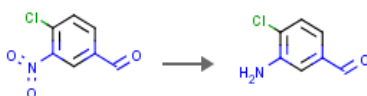
- Click Output to export the scheme to a PDF file



Different Query Types


Scenario #5 – mapping reactions and blocking substitution

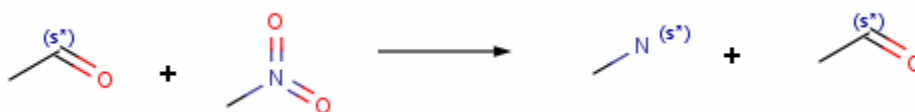
Retrieve reactions that involve the reduction of a nitro to an amine. Aldehyde must be present, but unchanged in the reaction



- On the Query page ensure that the reaction tab is highlighted
- Open Marvin Sketch by double clicking on the white box.
- Draw the following reaction:



- Use the (s*) feature to **Block Substitution** on the amino and aldehyde groups.
 - Click your cursor somewhere in the white space of MarvinSketch next to your structure.
 - Use the keyboard and type “period-s-*”  in succession. This creates an s* drag on your cursor.
 - Hover over the atoms where you want substitution blocked until a blue circle appears and click the mouse. **(s*)** appears at that atom.
 - Click the lasso button to eliminate the cursor drag.

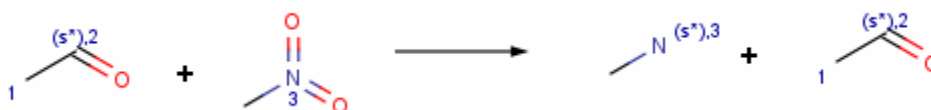


- Map the reaction.

To Manually Map Atoms:

Click the  button.

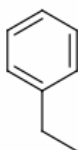
Click on the atom in the reactant and drag to the atom in the product. A number will appear next to the atom in both the reaction and product indicating that the atom has been mapped.



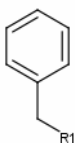
- Click Transfer Query
- **Search as / by** Substructure on all atoms.
- Click Search
- You should find more than 250 reactions.
- By scrolling through the results you can see the nitro to amine transformations with the aldehyde unchanged.

Scenario #6 - R group searching

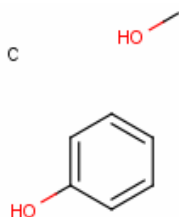
- On the Query page ensure that the substance and properties tab is highlighted
- Open Marvin Sketch by double clicking on the white box.
- Draw the following molecule:



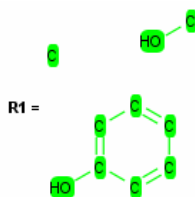
- Put your cursor somewhere in the white space of MarvinSketch and type **R1**. This will appear as a drag on the tip of your cursor. Place it on the appropriate spot where you want it in the molecule. Click the lasso tool to eliminate the R1 cursor drag.



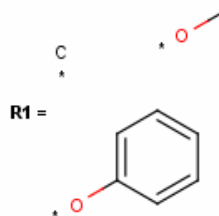
- Draw fragments to one side of the parent structure. For this example draw



- Select or Lasso to highlight all fragments. Immediately after lassoing, type **R1**. The following should appear.



- Your cursor should have an **R1** drag again. Click each atom in the fragment group that will attach to the **R1** site. Attachment points (asterisks) will appear. When finished, click the lasso tool to eliminate the R1 cursor drag. Your fragments should now look like this:

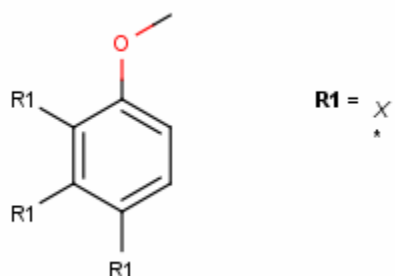


- Click transfer Query
- Search As drawn. Ignore Stereo, no salts, no mixtures, no isotopes. Click on further options. No charges, no radicals.

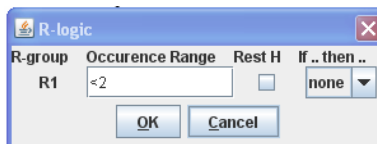
- Hit search. You should get less than 10 structures.

Scenario #7: R group searching – R logic

- Draw the following query and set the R1 fragments as follows.



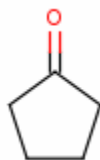
- Transfer Query.
- Search **As Drawn**
 - Note that there is a halogen atom assigned to each place where there is R1.
 - If the query is left as is, then you will obtain hits that contain halogen atoms only at all three assigned points.
- Go back to the Query page. Double click the frame to re-enter MarvinSketch.
- Leave Query drawn as is.
Select the **Chemistry** Menu
- Go to **Attribute** R-Logic. Set the Occurrence Range to <2.
- Transfer Query
- Select As Drawn and Click Search.
- A halogen should now be present at the ortho, meta, or para position to the methoxy group.



Scenario #8 – R group searching *within* a chain and atom lists

Looking for lactones and/or lactams of various ring sizes in the range of 5 to 7

- On the Query page ensure that the substance and properties tab is highlighted
- Open Marvin Sketch by double clicking on the white box.
- Draw the following molecule:



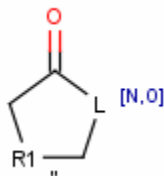
Generate an atom list on the alpha carbon to the carbonyl.

To make the Atom List L (N,O):

1. Click **Periodic Table** button.
2. Click **Periodic Table** tab.
3. Click **Atom List** button.
4. Select the atoms you would like in the group. (For this example use N and O).
5. Click the **Close** button. The atom list will appear as a drag on your cursor.
6. Click the appropriate location on the structure.
7. Click the lasso button to eliminate your cursor drag.



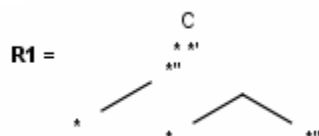
- Add an R group to represent the various ring size fragments.
 - In the white space of MarvinSketch type R1.
 - It will appear as a drag at the end of your cursor.
 - Place it on the appropriate spot within the cyclopentane ring
 - Click the lasso button to eliminate the R1 cursor drag.



- Draw a methyl, ethyl and propyl fragment to one side of the parent structure. Highlight them with the lasso tool and type R1.



- Your cursor should have an **R1** drag again. Click each atom in the fragment group that will attach to the **R1** site. Attachment points (asterisks) will appear. You need to go through the attachment point process two times, once for one direction, then the second direction denoted by the quotation “ sign. In this example, there will be two attachment points on each fragment because the fragments are imbedded *within* a ring. The same would be true if the R group was embedded within a chain.



- Click transfer Query

- Search As drawn.
- The following is an example of what the first 6 substances in the Substance (Grid) view look like.

<p>1</p> <p>25g 510</p> <p>Synthesize</p>	<p>2</p> <p>25g 510</p> <p>Synthesize</p>	<p>3</p> <p>25g 510</p> <p>Synthesize</p>
<p>4</p> <p>5g 510</p> <p>Synthesize</p>	<p>5</p> <p>5g 510</p> <p>Synthesize</p>	<p>6</p> <p>5g 510</p> <p>Synthesize</p>

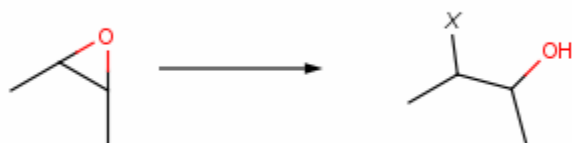
Scenario #9 Searching with Stereochemistry

Retrieve reactions that open epoxide rings with stereo inversion and halogenation. Allow ring size variability.

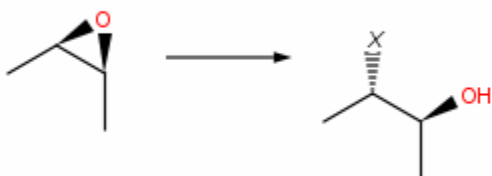
- On the Query page ensure that the reaction tab is highlighted
- Open Marvin Sketch by double clicking on the white box.
- Draw the following reaction:



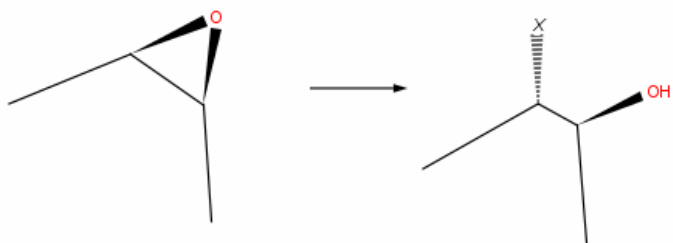
- Replace the methyl group on the open epoxide ring with the Reaxys Generic X, which represents any halogen. Click on the Reaxys Generic icon and select x. Hit close and your cursor will now have a X drag attached. Hover over the methyl group until a blue circle appears. Click your mouse. X will now be attached. Click on the lasso button to eliminate the X drag.



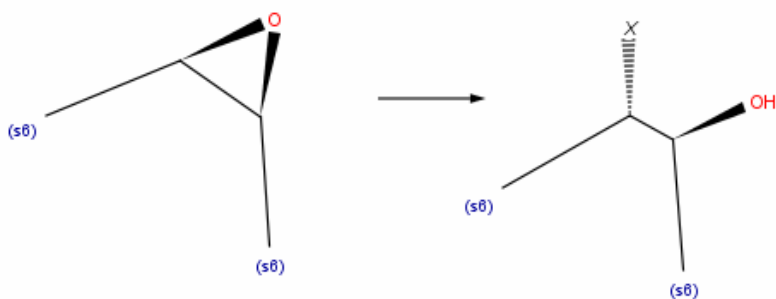
- Specify the bonds of the epoxide ring and the bonds of the halogen and hydroxyl groups with stereochemistry. Highlight each bond individually until blue parentheses appear. For the epoxide ring and the hydroxyl bond right click on each C-O bond, go to Edit bond → type → Single up. For the halogen go to Edit bond → type → single down.



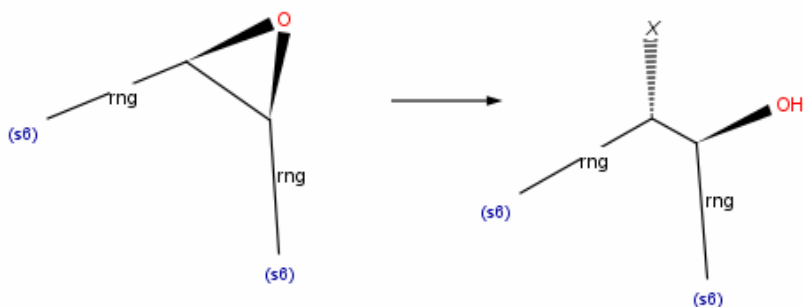
- You can stretch bonds to make them bigger and easier to manipulate with query bonds and mapping. Make both the reactant and the product larger.



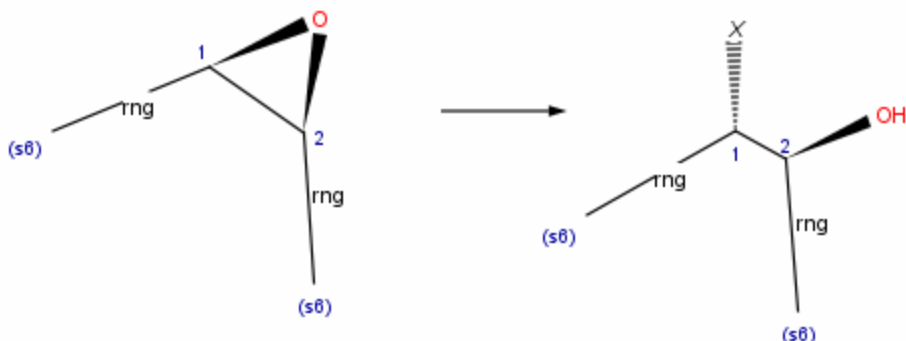
- Bring your cursor out into the white space of MarvinSketch and type `> s 6` on your keyboard. An **s6** drag will appear with your cursor. Hover over each carbon one at a time and click your mouse. The **(s6)** label will appear next to each atom. The number “6” in this situation is synonymous with “up to the maximum number of atoms that are chemically correct for this atom”.



- Hover your cursor each bond that you want labeled with **rng** until it is highlighted in blue parentheses. Right click on the bond and go to **Edit bond** → **topology** → **In Ring**.



- Manually map the two reacting centers



- Transfer Query

- Search as Drawn with no isotopes, no charges, no radicals
- Click Search. You should get over 300 reactions.

Reaxys Training Center

The Reaxys Training Center can be found by clicking on <https://www.reaxys.com/info/> or by clicking on the Info Button on the Reaxys menu bar. If you have any questions I encourage you to post them on the Reaxys forum site, or contact usinfo@reaxys.com.

HAPPY SEARCHING!!!!