ELSEVIER

事实型实验数据的运用与物质检索

俞靓

Elsevier生命科学产品客户顾问

提纲

- 常见的与物质物质检索有关的困难案例
- Reaxys中的解决方案
  - Reaxys中的Query Builder检索模式
  - Reaxys中的困难案例解决方案
  - Reaxys中的更多与性质检索有关技巧
- Reaxys物质检索小结

Case Study 1： “特定溶剂”下物质溶解度的查询

- 检索要求：
  - 如何快速获得物质的溶解度
  - 氯化钾在乙醇中的，20 ℃， 25 ℃， 30 ℃ 下的溶解度

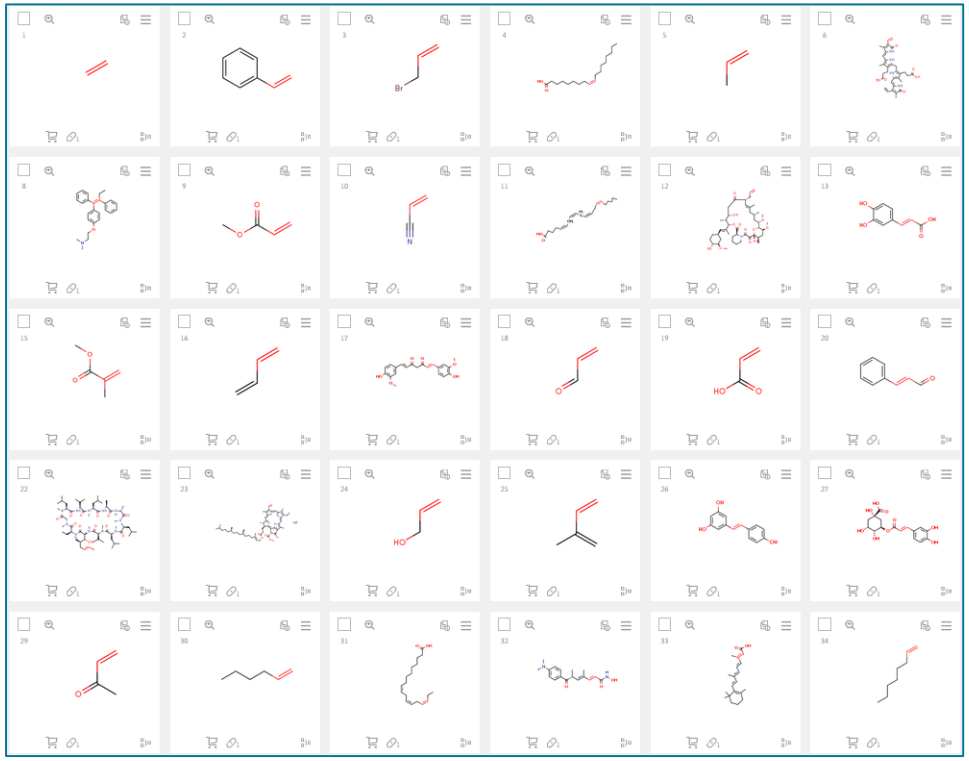
H2O

Ethanol

Case Study 2：具备“特殊性能”的物质检索

- 检索要求
  - 乙烯衍生物，不能成环
  - 具备机械性能报道，尤其是涉及“弹性性能”报道的化合物

C2H4



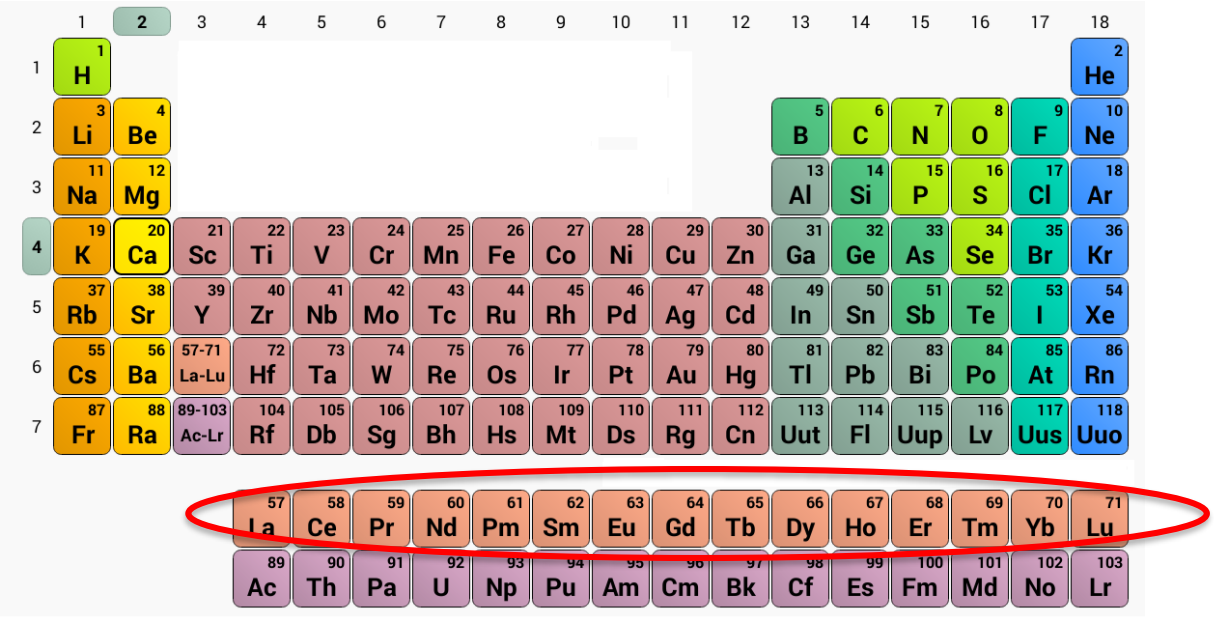
Case Study 3：“特定研究领域”的催化剂选择

- 检索可用于立体选择性催化的含Fe的，或者含镧系金属的催化剂

Chemoselectivity

Stereoselective

Regioselectivity



提纲

- 常见的与物质物质检索有关的困难案例
- Reaxys中的解决方案
  - Reaxys中的Query Builder检索模式
  - Reaxys中的困难案例解决方案
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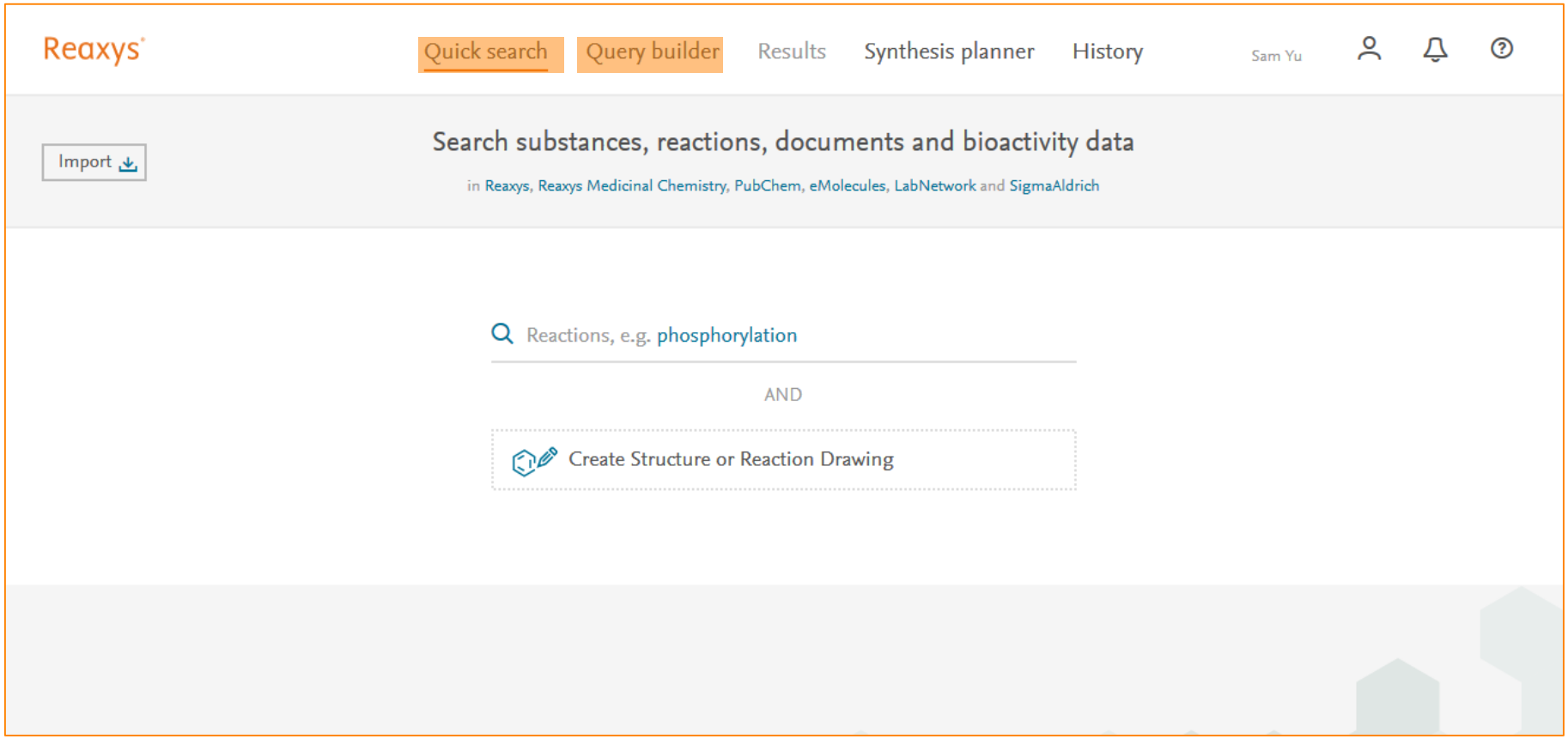
Reaxys的界面

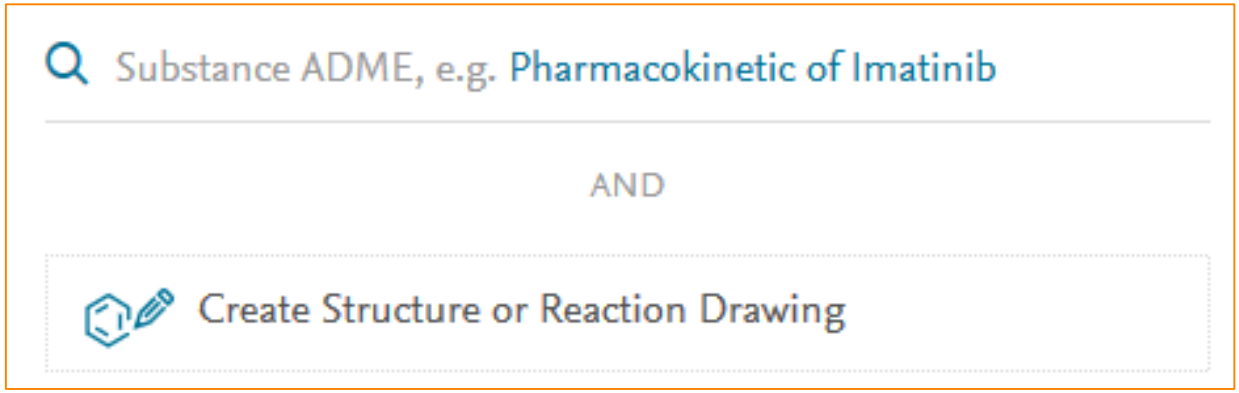
- www.reaxys.com

Quick Search

Query Builder



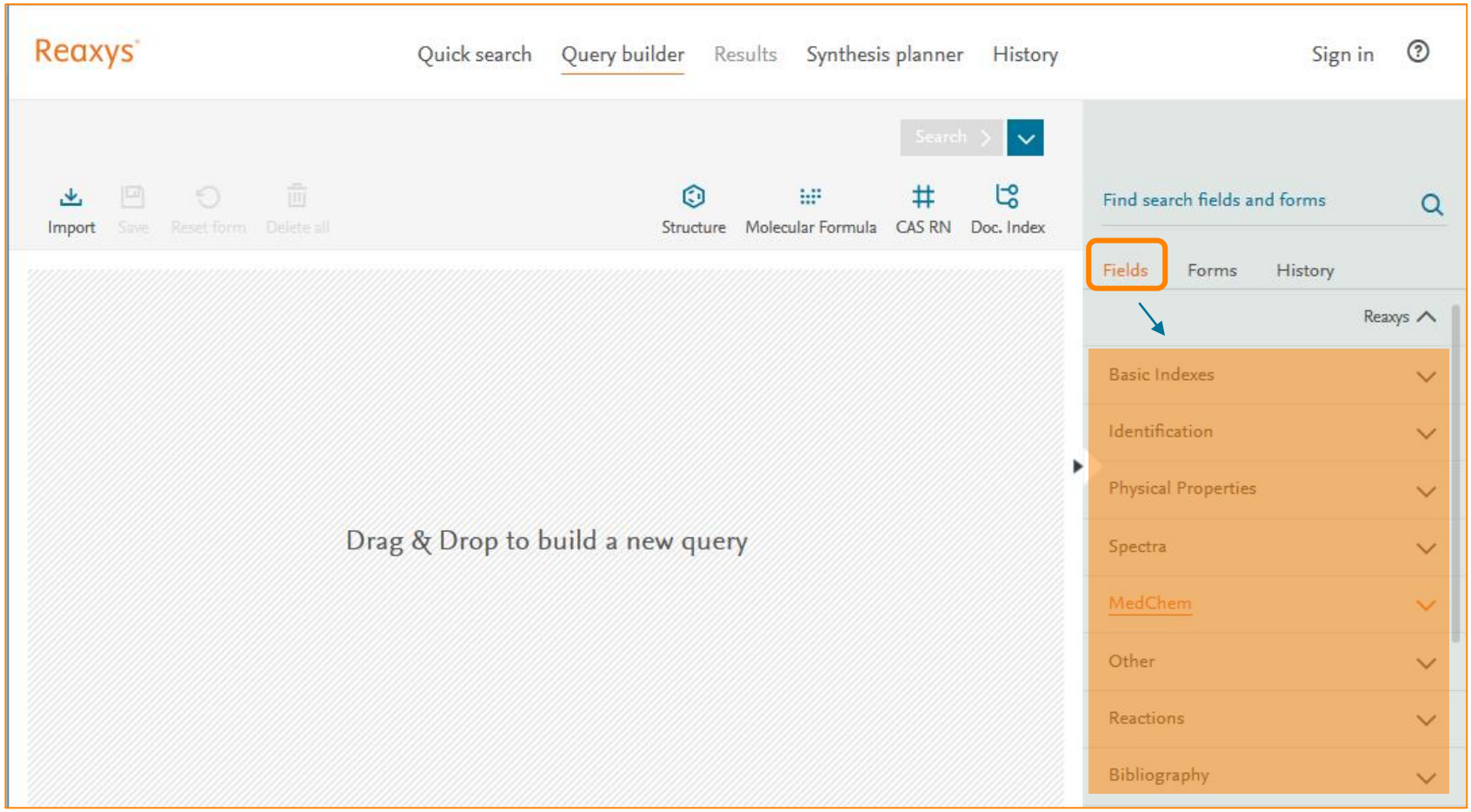
Reaxys的检索方式—Quick Search



Quick Search中可以使用的方式：

1. 物质名称， Gefitinib
2. 反应名称， Wittig Reaction
3. 物质理化性质， Solubility of Gefitinib
4. 物质的谱图， NMR of Gefitinib
5. 分子式， C22H24ClFN4O3
6. 反应类型， Substitution
7. 关键词， Immunology Oncology
8. 反应结构，物质结构

Reaxys的检索方式—Query Builder

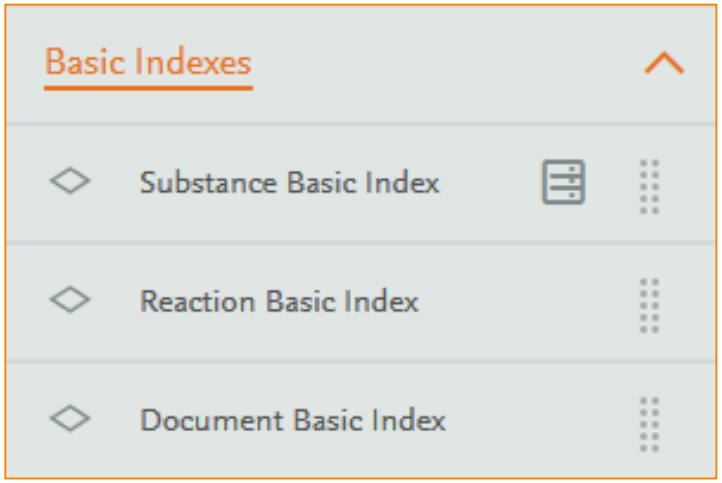


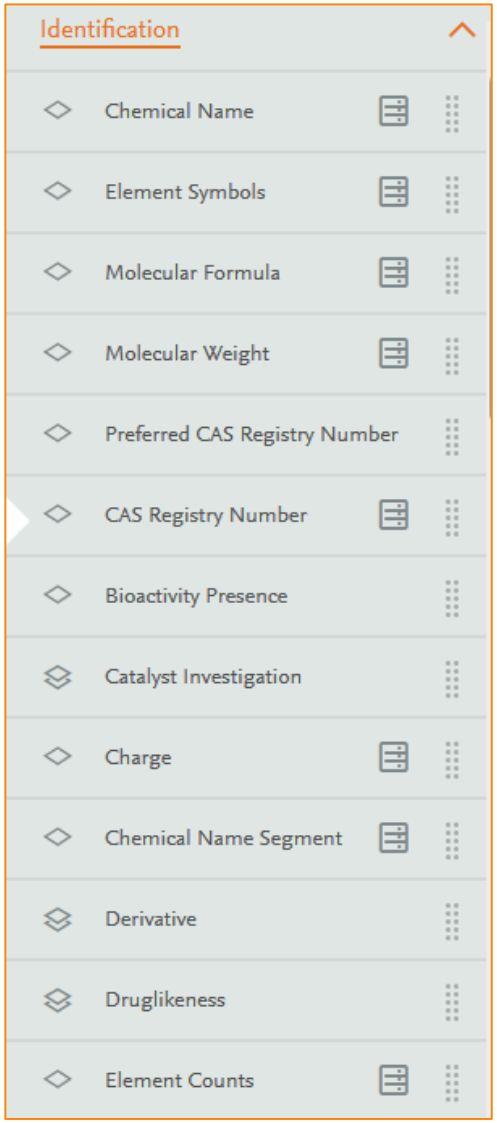
Query Builder模块下，Fields中可以选择不同类型的字段进行自由组合检索

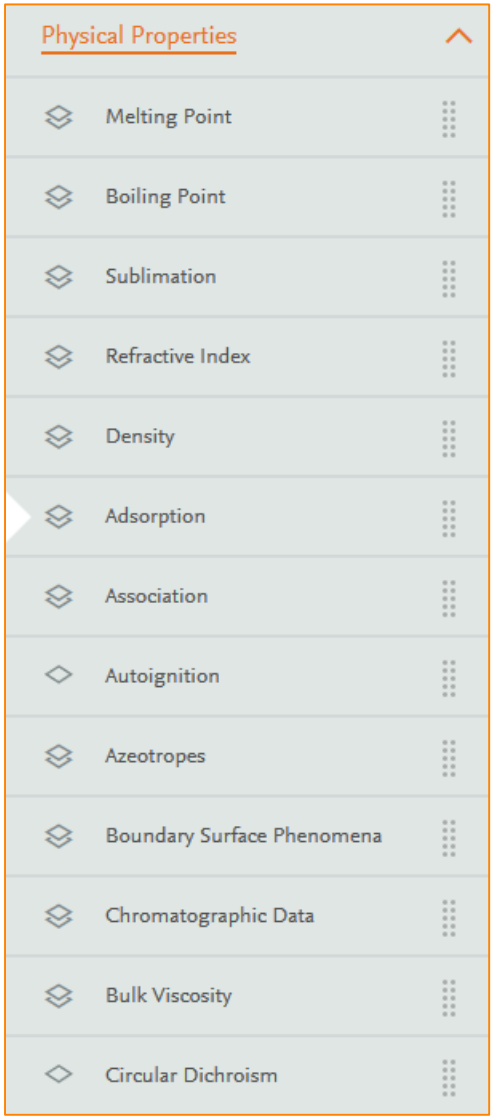
Reaxys中的字段检索

Tips:

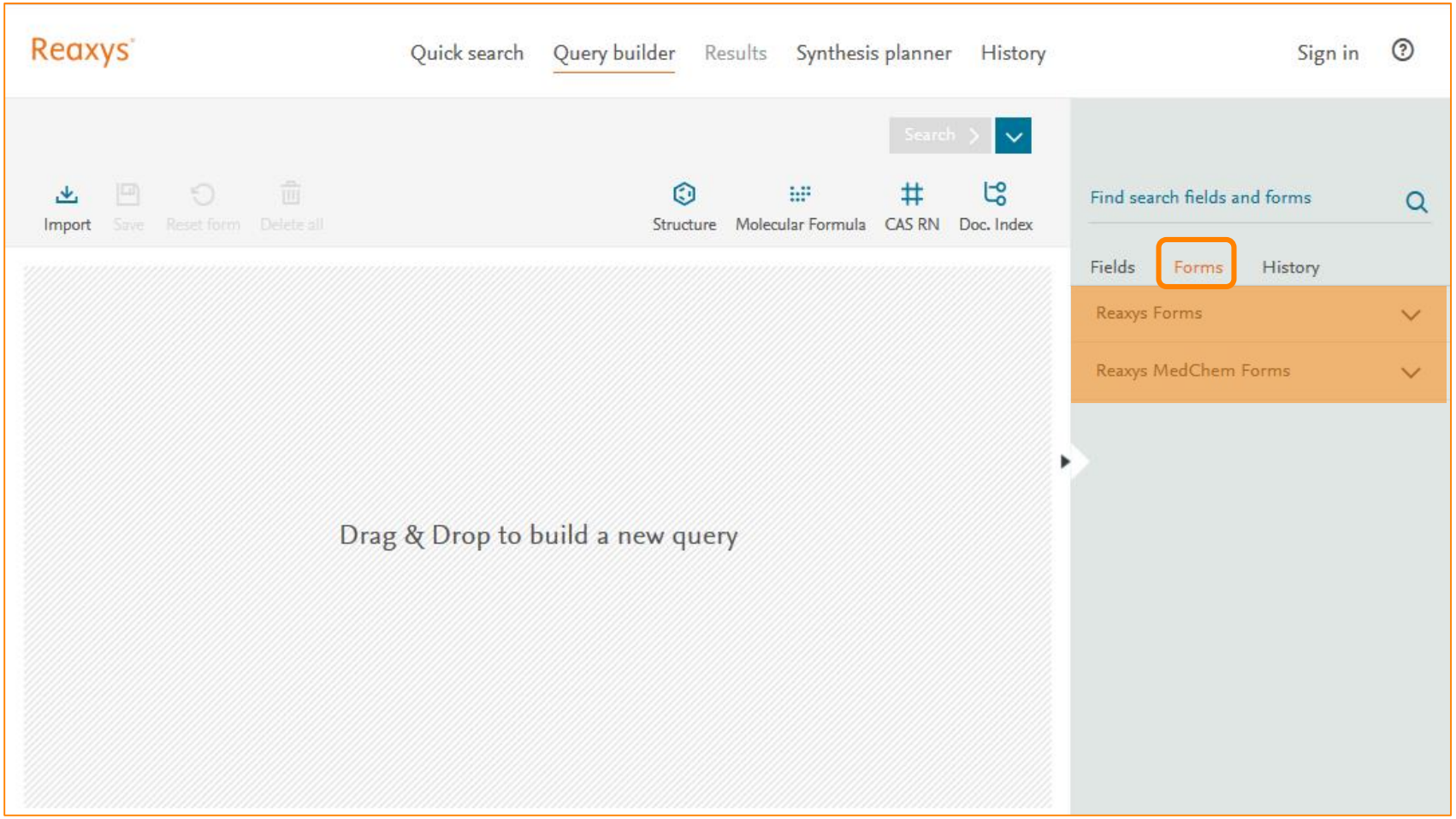
Reaxys提供8种不同的分类，每种分类中拥有和这种分类相关的多种字段，可以依据这些字段自由组合进行检索





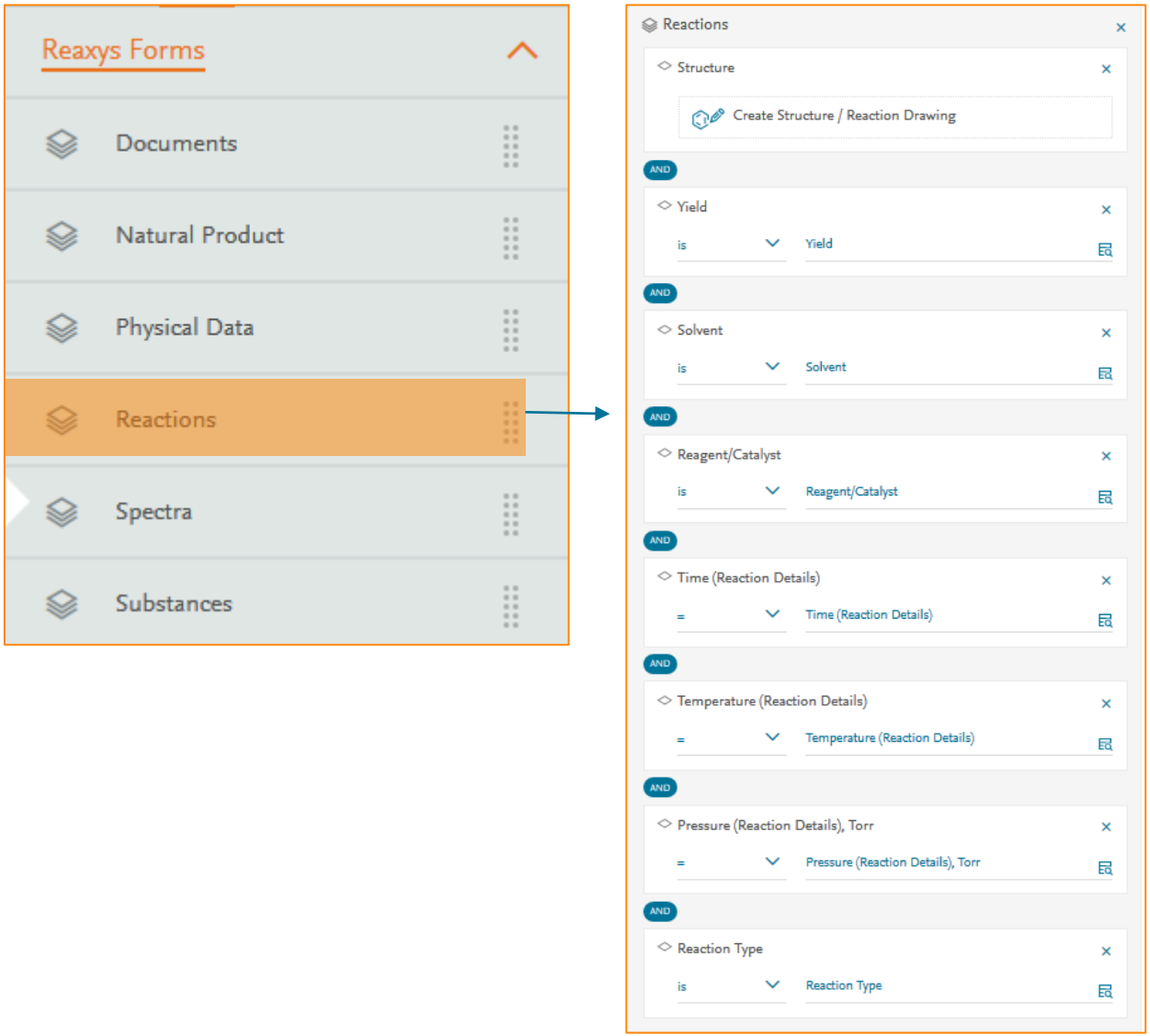


Reaxys检索方式—Query Builder Forms



Query Builder模块下，Forms中Reaxys和RMC的预设模块检索

Reaxys Form中的预设模块



反应结构

反应收率

反应溶剂

试剂催化剂

反应时间

反应温度

反应压力

反应类型

提纲

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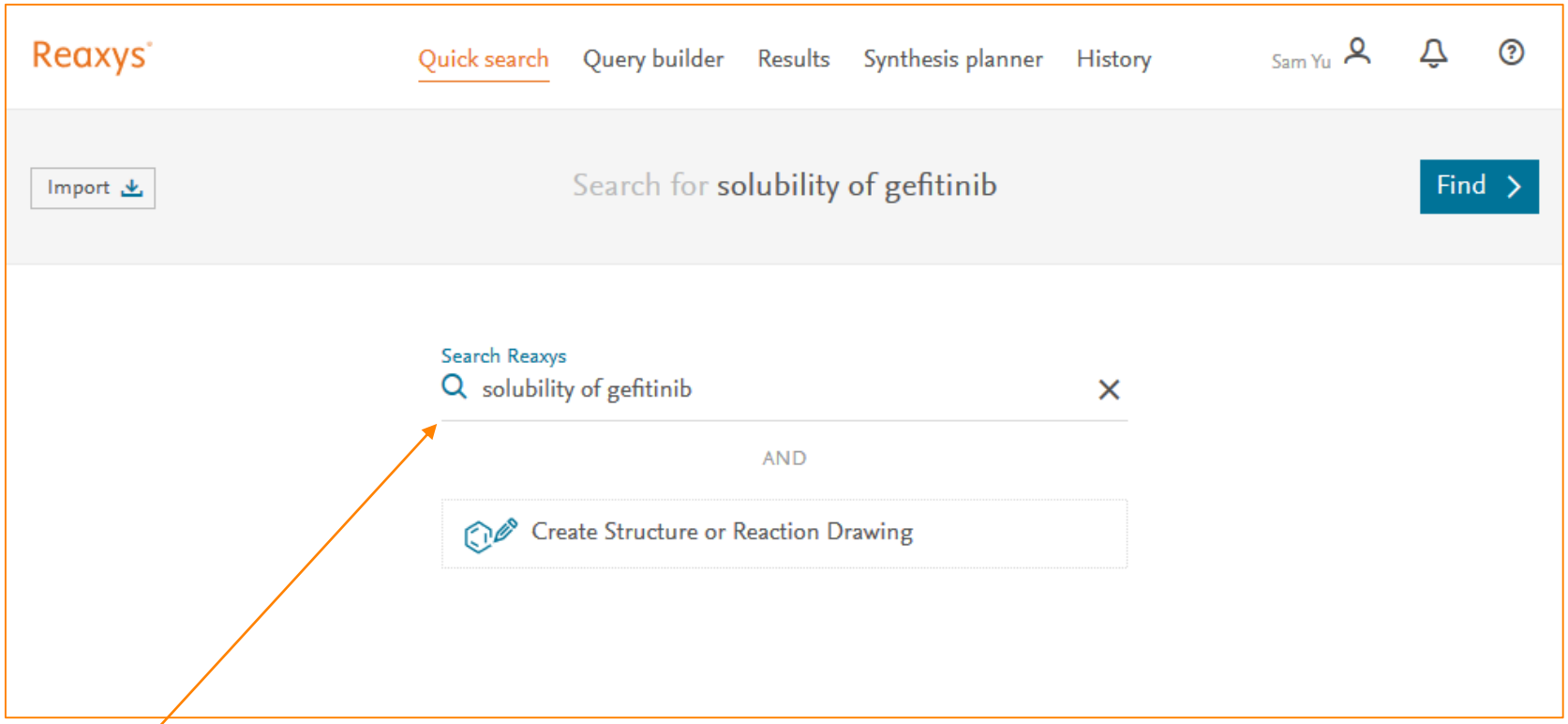
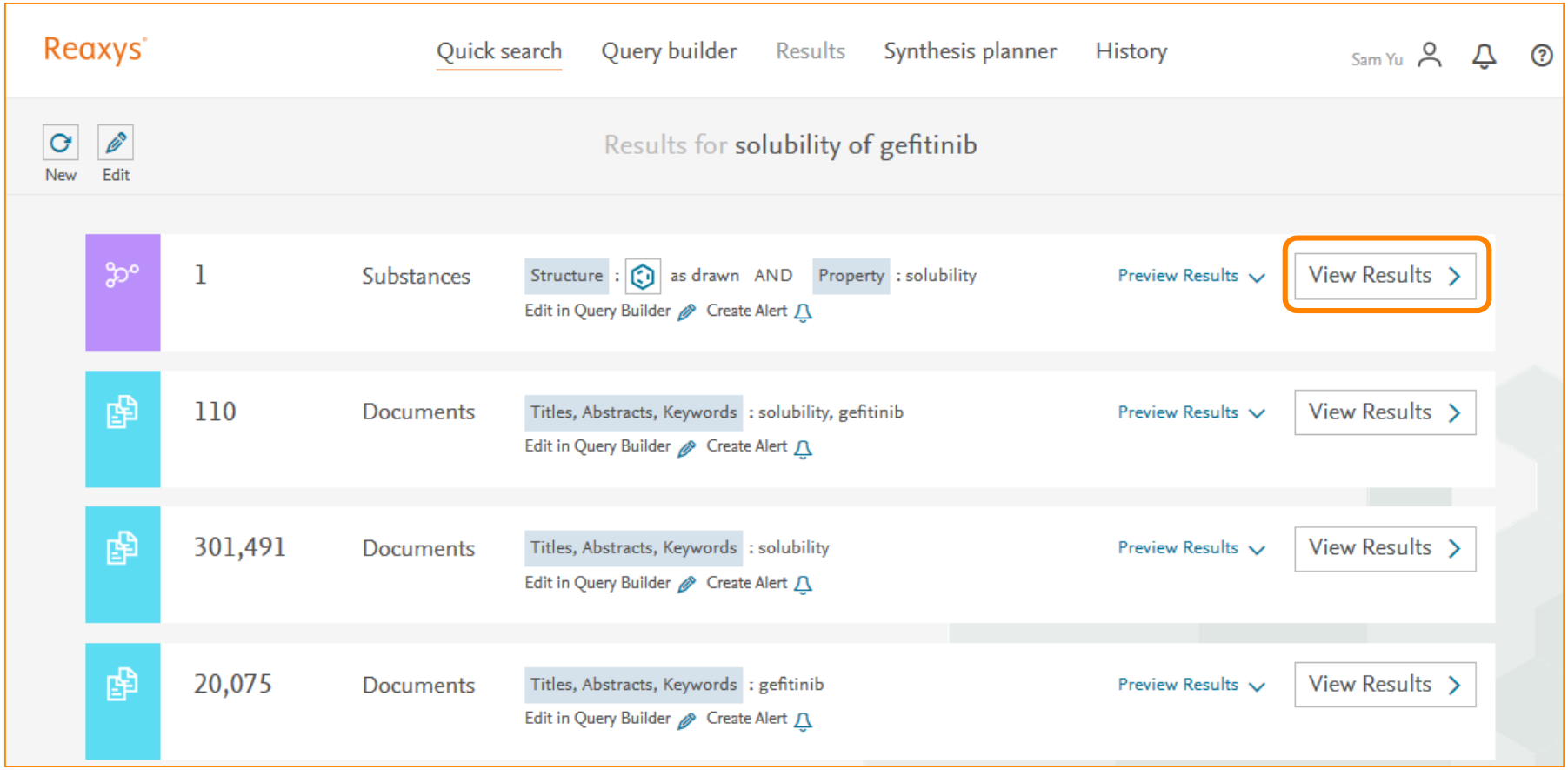
Case Study 1：快速获得物质的理化性质

- 快速的案例
- 检索具体化合物的溶解性数据（Gefitinib）

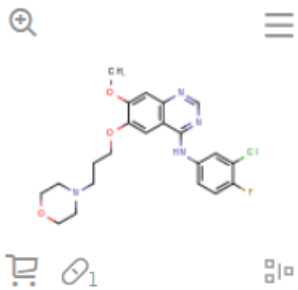


直接用自然语言在输入，solubility of gefitinib，检索

Reaxys直接给出结果



最后的结果



gefitinib

$C_{22}H_{24}ClFN_4O_3$ 446.909 8949523 184475-35-2

Hit Data - 1 | Bioactivity (All) | Other Data - 2,552 | Preparations - 65

Identification | Physical Data - 67 | Reactions - 101

Druglikeness | Spectra - 53 | Targets - 1,047

Documents - 3,884

Hit Data - 1

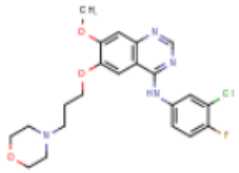
Solubility (MCS) - 1 hits out of 1

Show/Hide columns

Solubility, $g \cdot l^{-1}$	Saturation	Temperature (Solubility (MCS)), °C	Solvent (Solubility (MCS))	Reference
0.0021	in pure solvent	20	water	Zhao, Feng; Lin, Zhaohu; Wang, Feng; Zhao, Weili; Dong, Xiaochun - Bioorganic and Medicinal Chemistry Letters, **2013**, vol. 23, # 19, p. 5385 - 5388 Full Text ↗ Cited 16 times ↗ Details > Abstract >

Hit Data直接给出具体的实验数据，以及检测条件和全文链接

Reaxys中的物质理化性质



gefitinib

$C_{22}H_{24}ClFN_4O_3$ 446.909 8949523 184475-35-2

Hit Data - 1
Bioactivity (All)
Other Data - 2,552
Preparations - 65
Identification
Physical Data - 67
Reactions - 101
Druglikeness
Spectra - 53
Targets - 1,047
Documents - 3,884

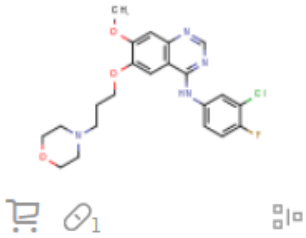
Physical Data - 67

- Melting Point - 21
- Association (MCS) - 1
- Chromatographic Data - 4
- Conformation - 1
- Crystal Phase - 7
- Crystal Property Description - 14
- Crystal System - 1
- Dissociation Exponent - 2
- Further Information - 1
- Interatomic Distances and Angles - 2

Colour & Other Properties	Location	Reference
white	Paragraph 0037	CSPC Zhongqi Pharmaceutical Technology(Shijiazhuang)Corporation Limited; CSPC Ouyi Pharmaceutical Co., Ltd; Zhang, Yanqiao; Li, Xiaofang; Sun, Wentao; Zhang, Sujuan; Geng, Jia - CN103319422, **2016**, B Full Text Details Abstract No author - CN106854184, **2017**, A Full Text Details Abstract
white	Paragraph 0037; 0047	No author - CN106854185, **2017**, A Full Text Details Abstract
white	Paragraph 0065	Chongqing Laimei Longyu Pharmaceutical Co., Ltd.; Wen Huiying; Ren Sixiao; Xu Xiaofang; Tang Qunlian; Yang Shengxi - CN107098863, **2017**, A Full Text Details Abstract
white	Paragraph 0015	Zhengzhou University The First Affiliated Hospital; Cheng Weiyan; Zhang Xiaojian; Tian Xin - CN106432202, **2017**, A Full Text Details Abstract
yellow	supporting information	Kang, Sung Kwon; Lee, Seung Wook; Woo, Daekoo; Sim, Jaehoon; Suh, Young-Ger - Synthetic Communications, **2017**, vol. 47, # 21, p. 1990 - 1998 Full Text Details Abstract
white	Paragraph 0126; 0133	shanghai tianci shengwu gu Biological Engineering Co., Ltd.; Li, Han Pu; Li, Jianzhi; Liu, hai; Hu, xu Hua; Zheng, Xiaoli; Sun, Li; Xie, Lin - CN105218476, **2016**, A Full Text Details Abstract

Feedback

Reaxys中的谱图



gefitinib

$C_{22}H_{24}ClFN_4O_3$ 446.909 8949523 184475-35-2

Hit Data - 1 | Bioactivity (All) | Other

Identification | Physical Data - 67

Druglikeness | Spectra - 53

Spectra - 53

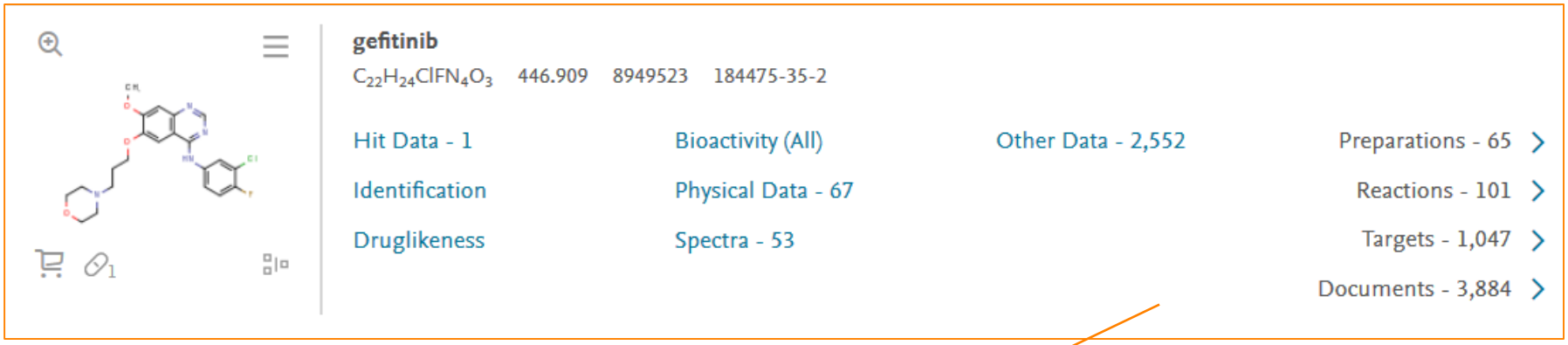
- NMR Spectroscopy - 31
- IR Spectroscopy - 6
- Mass Spectrometry - 11
- UV/VIS Spectroscopy - 4
- Raman Spectroscopy - 1

Tips：

Reaxys直接摘录原文中的NMR谱图描述，并提供原文中的位置

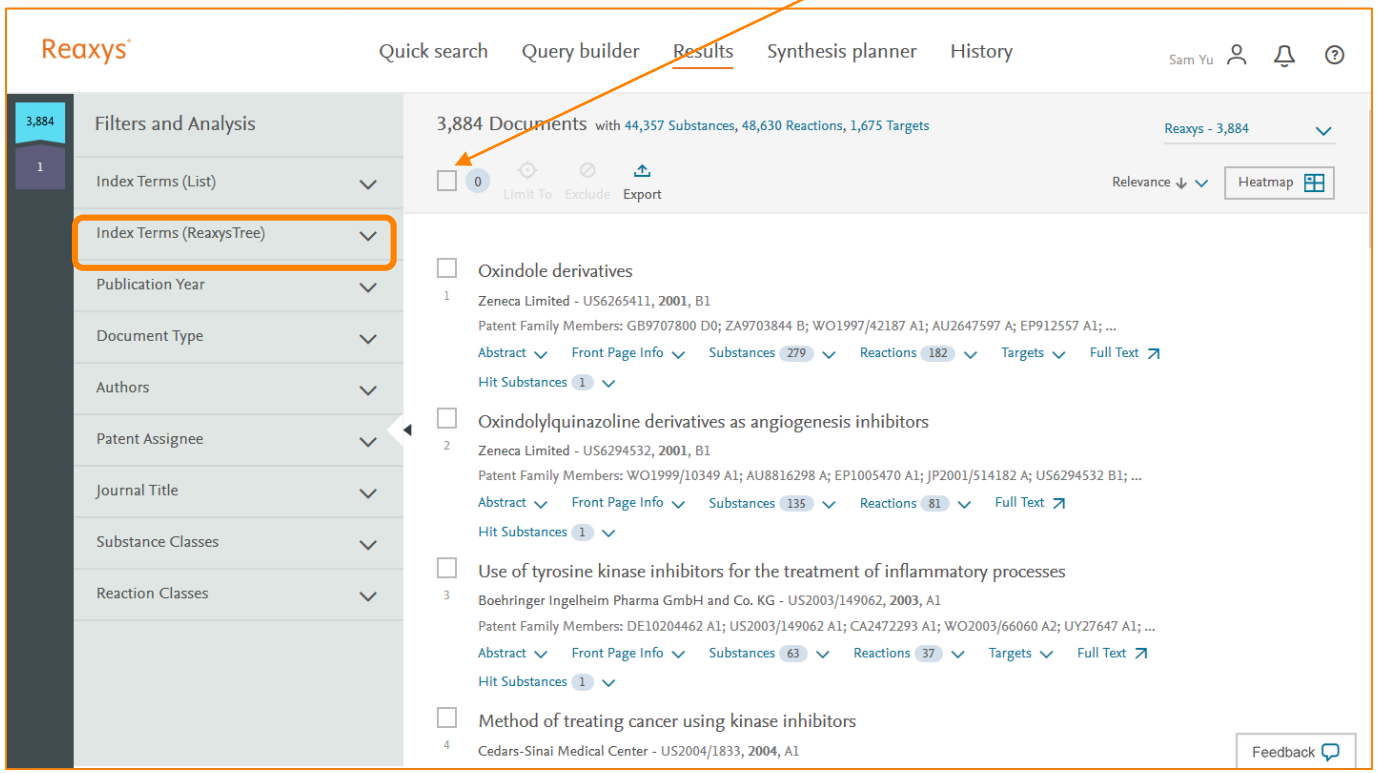
1H NMR (400 MHz, d6-DMSO) O 9.44 (5, 1H), 8.50 (5, 1H), 8.12 (dd, J= 6.9, 2.7 Hz,1H), 7.80 (m, 2H), 7.44 (t, 1H), 7.20 (5, 1H), 4.18 (t, J= 6.7 Hz, 2H), 3.94 (5, 3H), 3.59(t, J = 4.4 Hz, 4H), 2.49 (t, J = 6.9 Hz, 2H), 2.41 (bs, 4H), 2.00 (m, 2H).	Paragraph 0035	**SCINOPHARM (CHANGSHU) PHARMACEUTICALS, LTD.; ZHANG, Xiao-heng; LV, Xizhou** - WO2015/188318, 2015, A1 Full Text ↗ Show details >
13C NMR (100 MHz, d6-DMSO) O 156.48, 154.94, 153.57 (J = 241 Hz), 153.05,148.74, 147.43, 137.33 (J = 3 Hz), 123.91, 122.77 (J = 7 Hz), 119.19 (J = 19 Hz),116.90 (J=21 Hz), 109.26,107.72,103.14,67.59,66.43,56.31,55.35,53.73,26.13.	Paragraph 0035	**SCINOPHARM (CHANGSHU) PHARMACEUTICALS, LTD.; ZHANG, Xiao-heng; LV, Xizhou** - WO2015/188318, 2015, A1 Full Text ↗ Show details >

Reaxys中的分析文献的获取

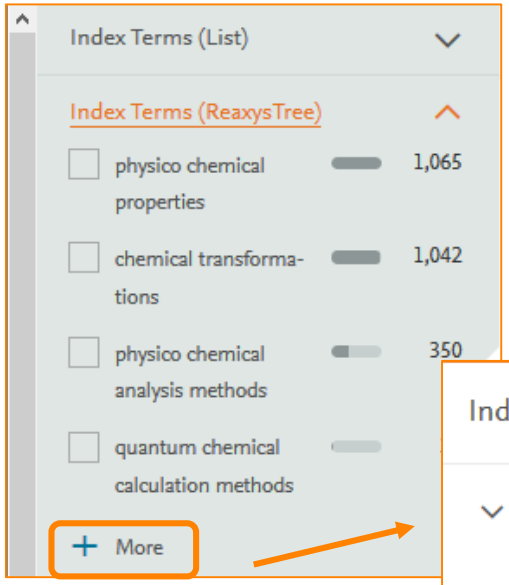


Tips:

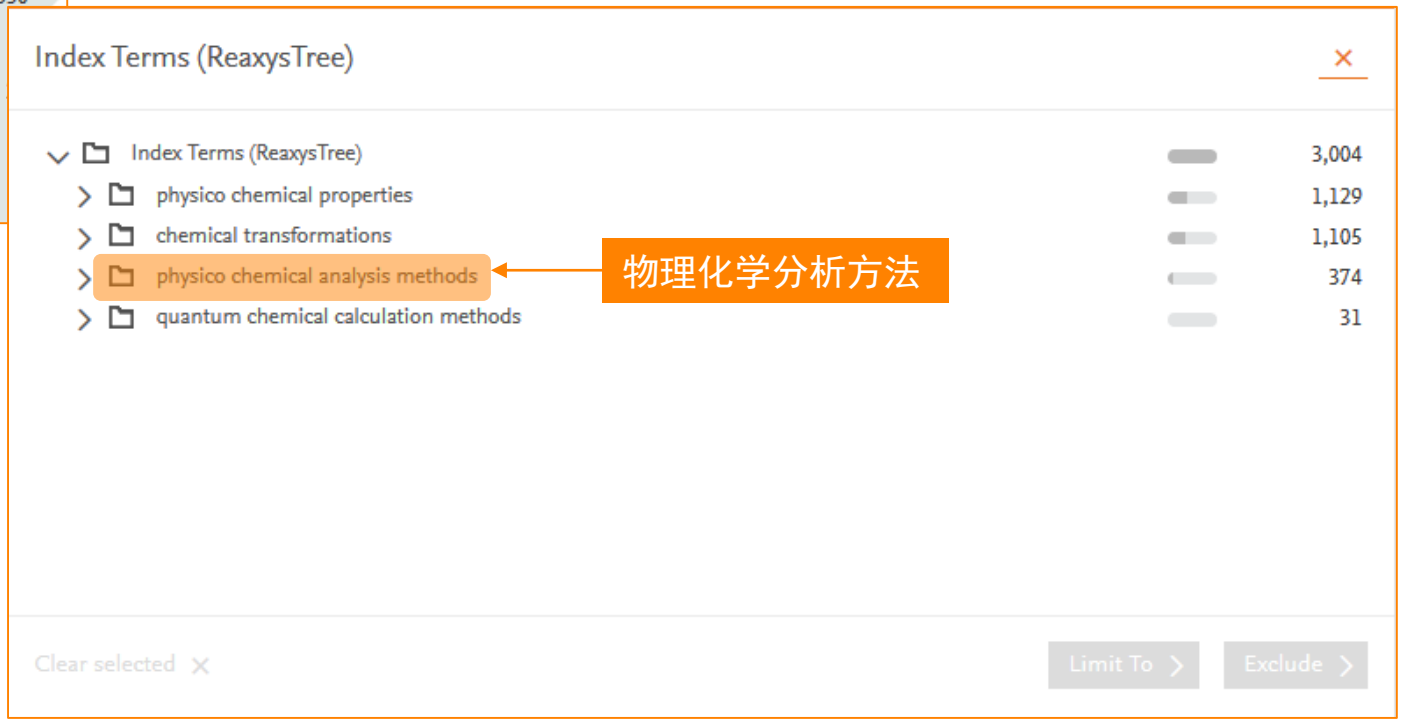
获得文献后，可以通过Reaxys的文献过滤工具对文献进行后处理



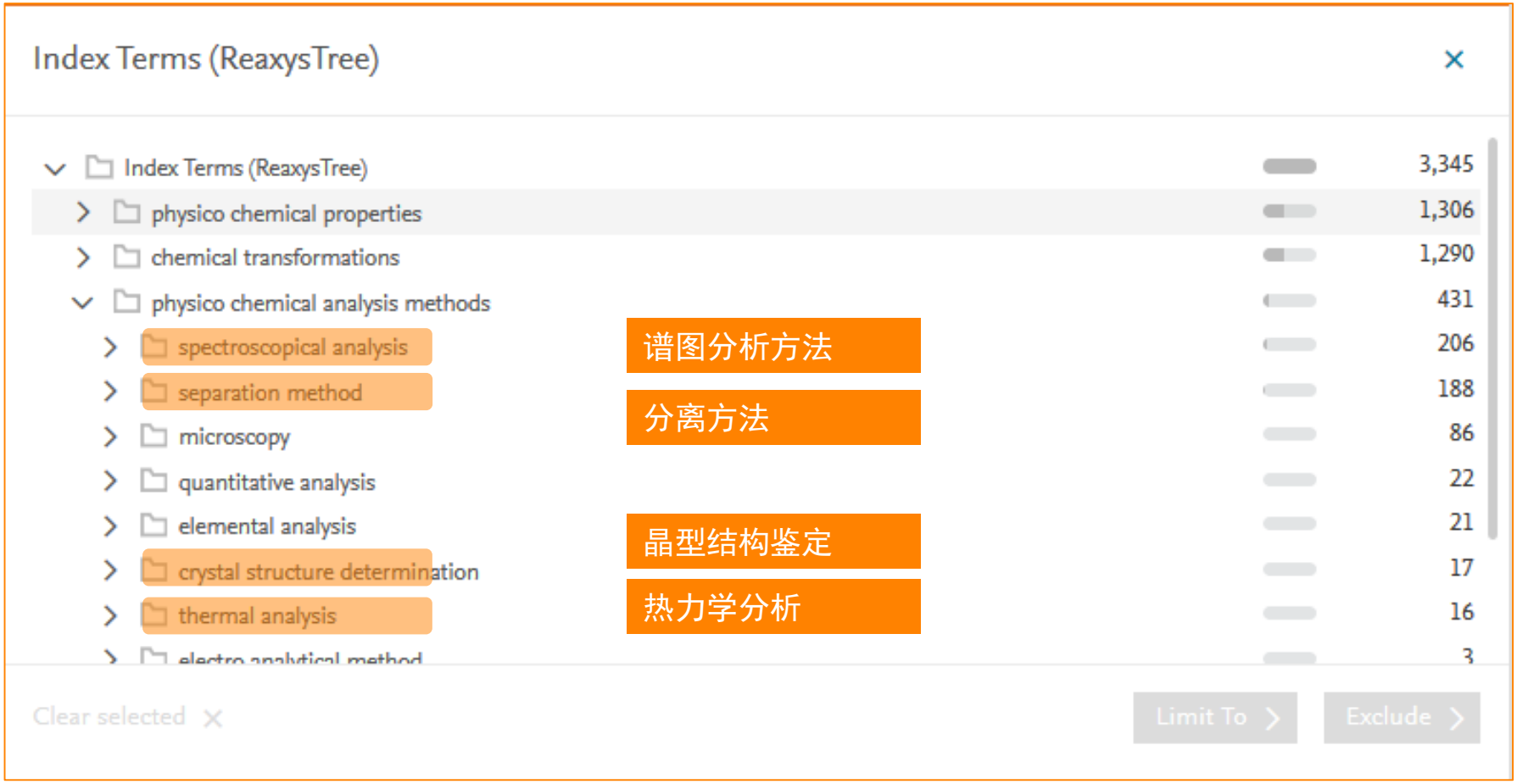
Index Term Reaxys Tree的应用



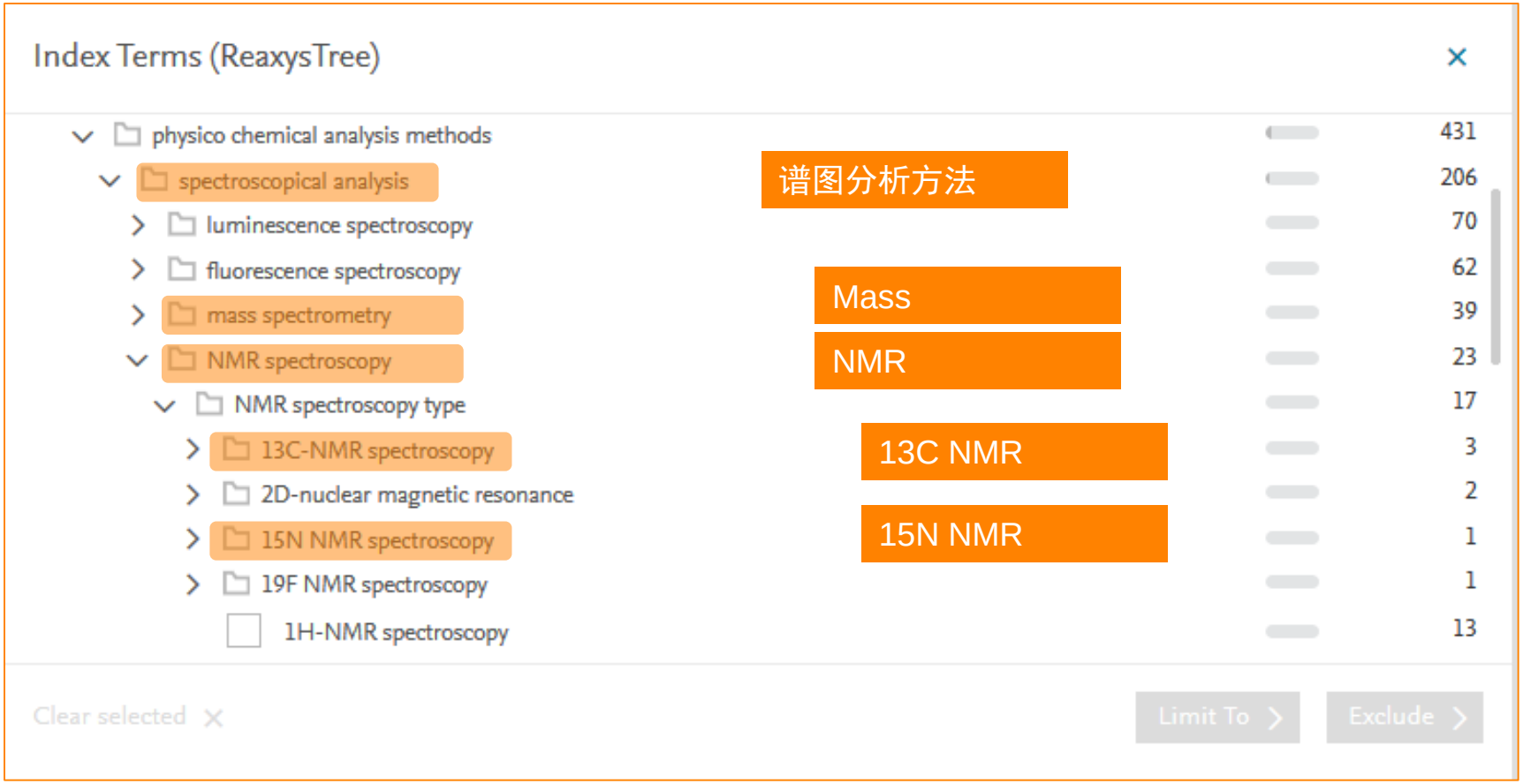
Reaxys通过Index Term Reaxys Tree的方式，将文献进行精确分类，帮助大家快速定位所需分析文献。



物理化学分析方法中的细节性分类

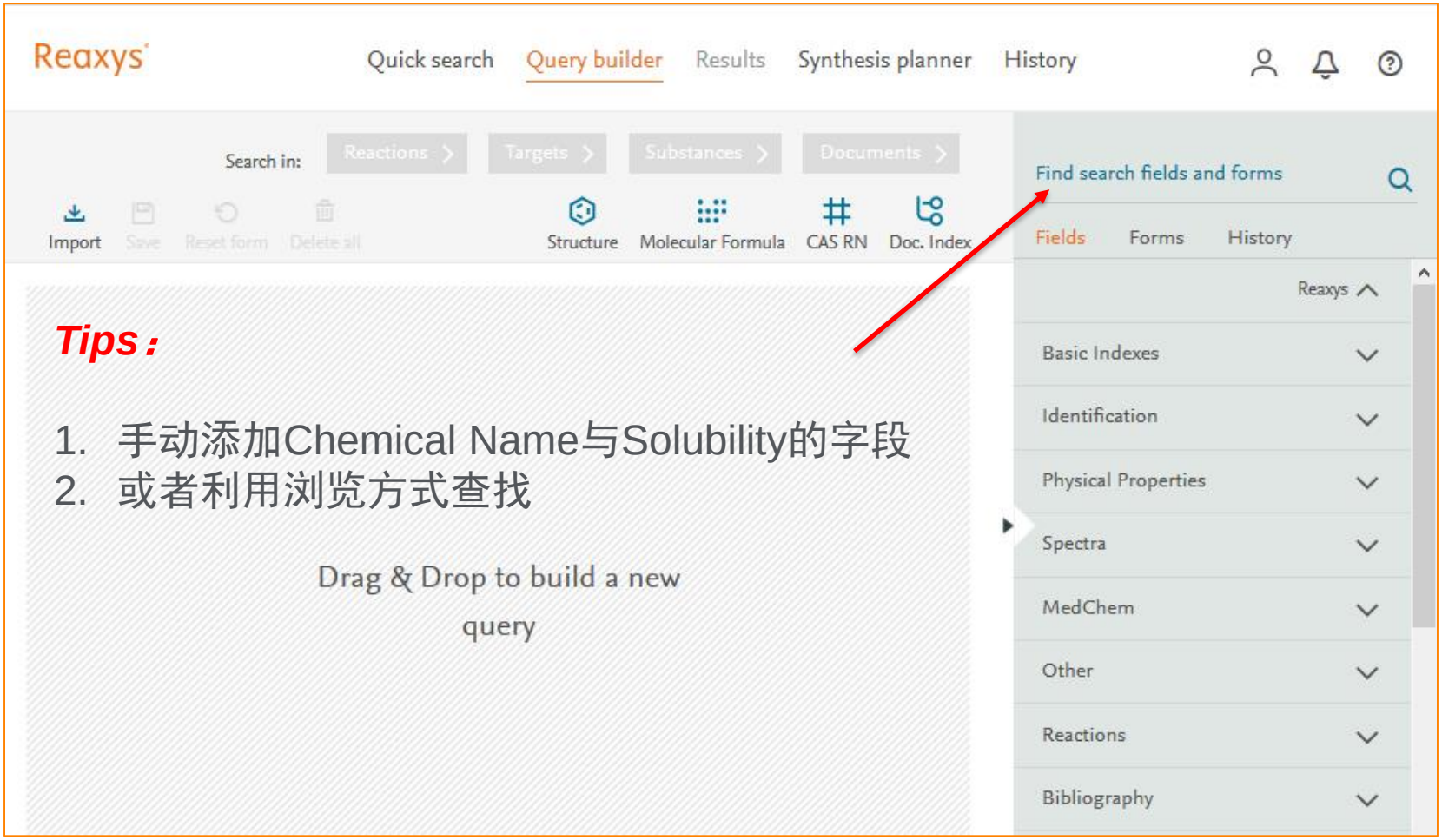


谱图分析方法下面的细节分类



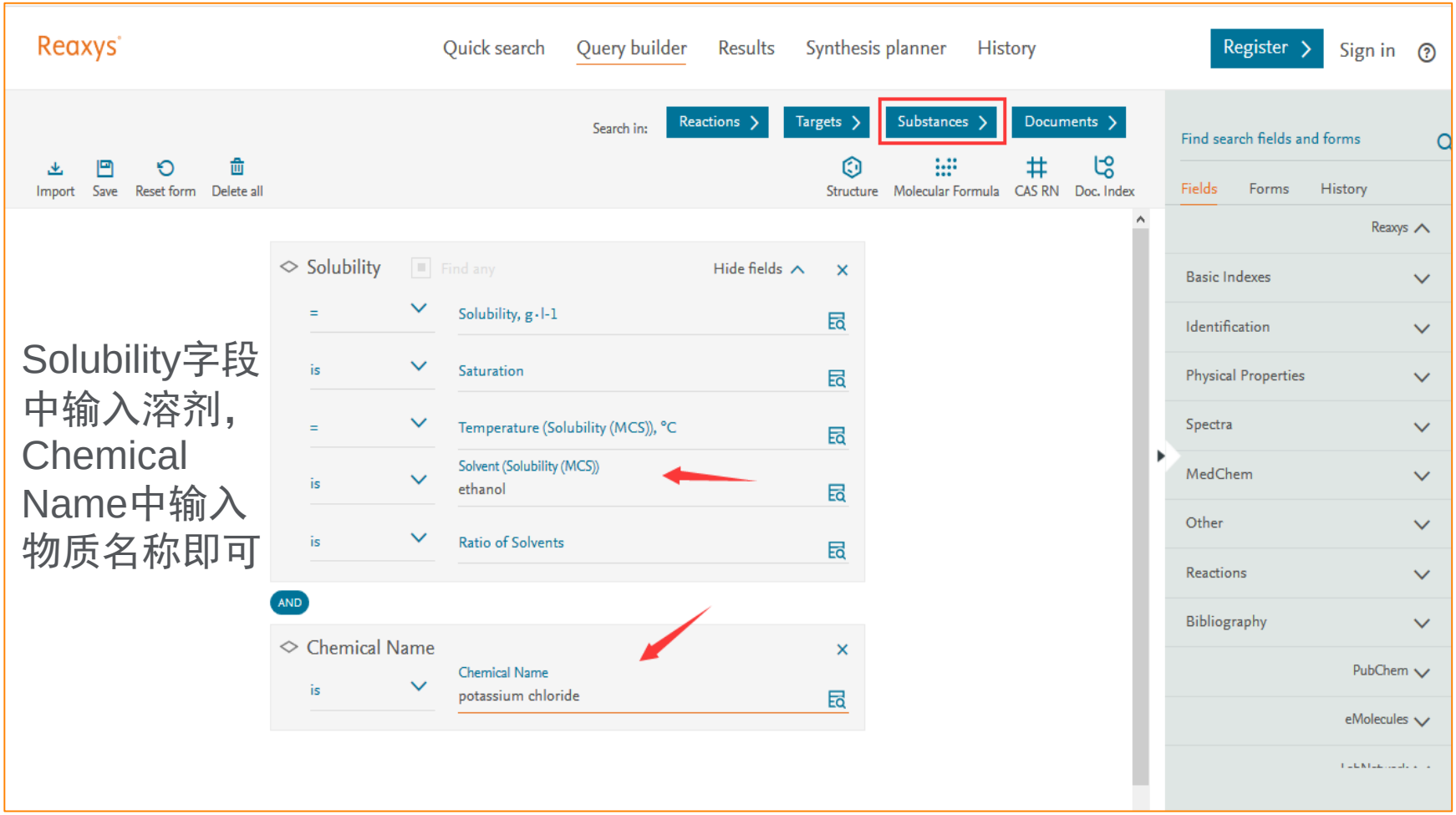
案例的衍生：理化性质的高级应用

- 检索检索氯化钾在乙醇中的溶解度



利用Query Builder创建检索式

- Reaxys中的检索策略



Solubility字段中输入溶剂，Chemical Name中输入物质名称即可

Reaxys直接给出结果

1 Substances out of 7,118 Documents, containing 4,141 Reactions, 60 Targets

Reaxys - 1

0 selected Limit To Exclude Export

Sort by No of References Grid Heatmap

1

CIK

potassium chloride

CIK 74.5513 3534978

Hit Data - 20 | Bioactivity (All) | Other Data - 784 | Preparations - 414

Identification | Physical Data - 2,972 | Reactions - 4,141

Druglikeness | Spectra - 182 | Targets - 60

Documents - 7,118

Hit Data - 20

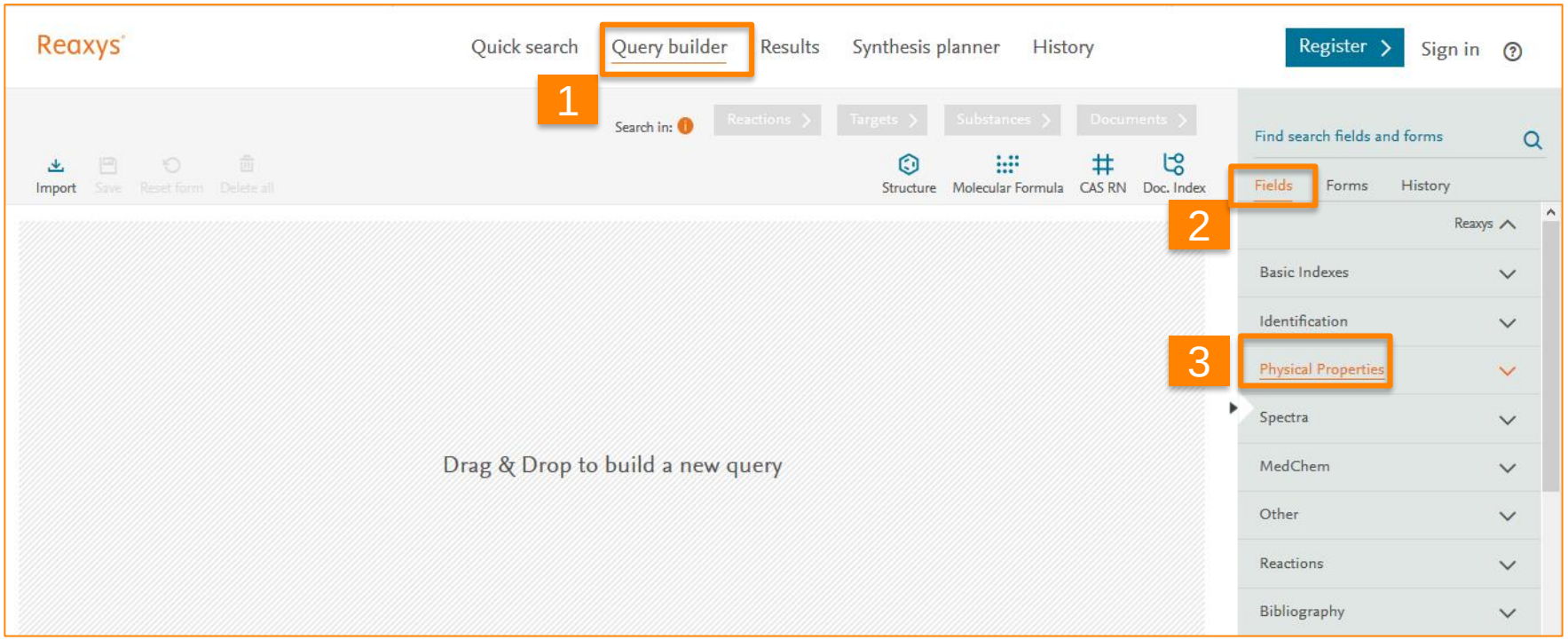
Solubility (MCS) - 20 hits out of 429

Show/Hide columns

Solubility, $g \cdot l^{-1}$	Temperature (Solubility (MCS)), °C	Solvent (Solubility (MCS))	Comment (Solubility (MCS))	Reference
	20	ethanol	Solubility: 0.012 mol/kg solvent	El-Dossoki - [Indian Journal of Chemistry - Section A Inorganic, Physical, Theoretical and Analytical Chemistry, 2005, vol. 44, # 8, p. 1594 - 1596] Full Text Cited 4 times Details Abstract
	25	ethanol	Solubility: 0.025 mol/kg solvent	El-Dossoki - [Indian Journal of Chemistry - Section A Inorganic, Physical, Theoretical and Analytical Chemistry, 2005, vol. 44, # 8, p. 1594 - 1596] Full Text Cited 4 times Details Abstract
	30	ethanol	Solubility: 0.037 mol/kg solvent	El-Dossoki - [Indian Journal of Chemistry - Section A Inorganic, Physical, Theoretical and Analytical Chemistry, 2005, vol. 44, # 8, p. 1594 - 1596] Full Text Cited 4 times Details Abstract
	35	ethanol	Solubility: 0.043 mol/kg solvent	El-Dossoki - [Indian Journal of Chemistry - Section A Inorganic, Physical, Theoretical and Analytical Chemistry, 2005, vol. 44, # 8, p. 1594 - 1596] Full Text Cited 4 times Details Abstract

Case Study 2：具备“特殊性能”的物质检索

- 检索要求
  - 乙烯衍生物，不能成环
  - 具备“机械性能”报道的化合物
  - 按照以下的标签顺序进行“理化性质”反推的检索
  - “弹性性能”在案例衍生中解决



Reaxys的理化性质列表

Physical Properties

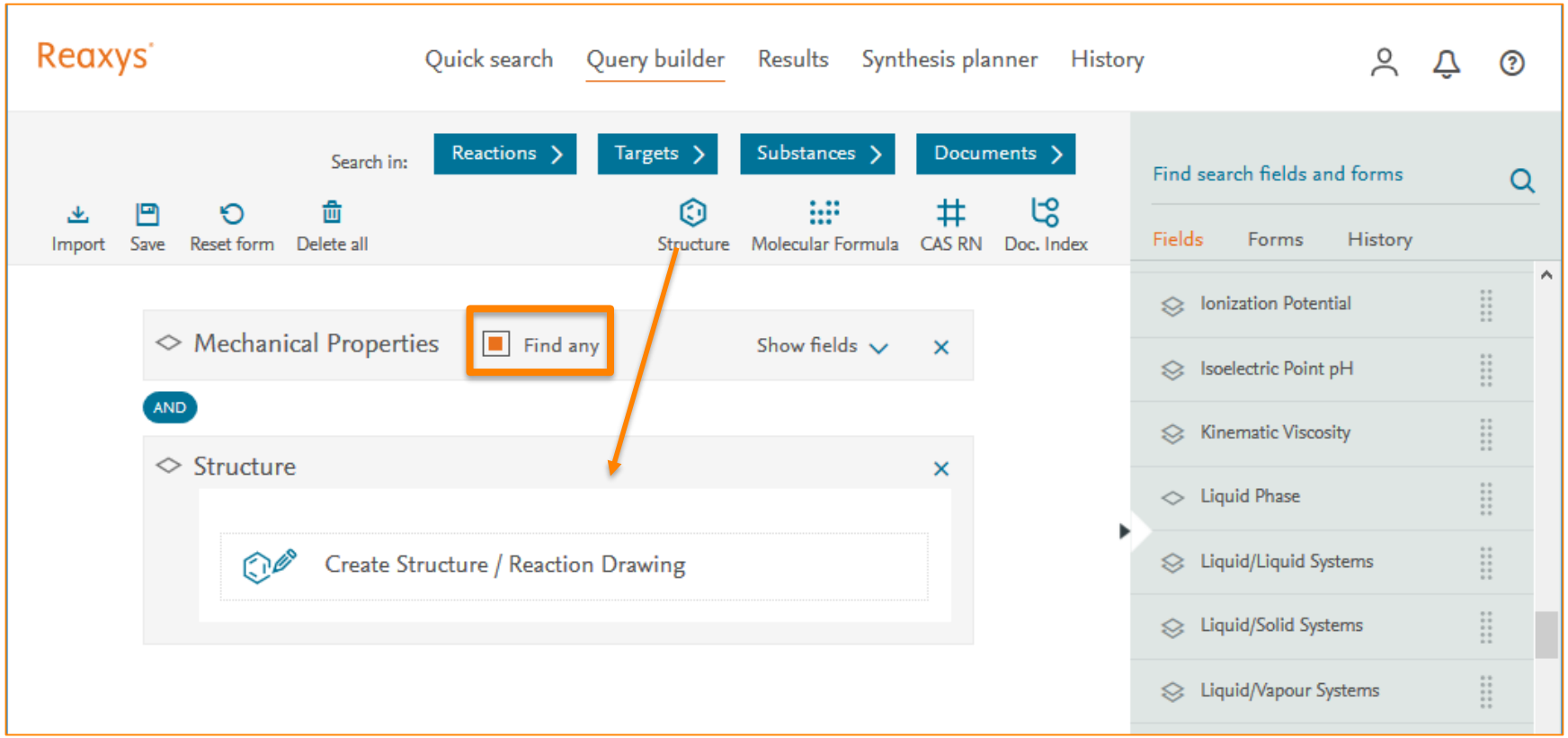
- Melting Point
- Boiling Point
- Sublimation
- Refractive Index
- Density
- Adsorption
- Association
- Autoignition

- Critical Temperature
- Critical Volume
- Crystal Phase
- Crystal Property Description
- Crystal System
- Decomposition
- Dielectric Constant
- Dissociation Energy
- Dissociation Exponent

- Electrical Moment
- Electrical Polarizability
- Electrochemical Behaviour
- Electrochemical Characteristics
- Electrochemistry Da
- Electrolytic Conduct
- Electron Binding
- Energy Barriers
- Energy Data

- Liquid/Vapour Systems
- Magnetic Data
- Magnetic Susceptibility
- Mechanical & Physical Properties
- Mechanical Properties
- Molecular Deformation
- Mutarotation
- Optical Data
- Optical Rotatory Dispersion

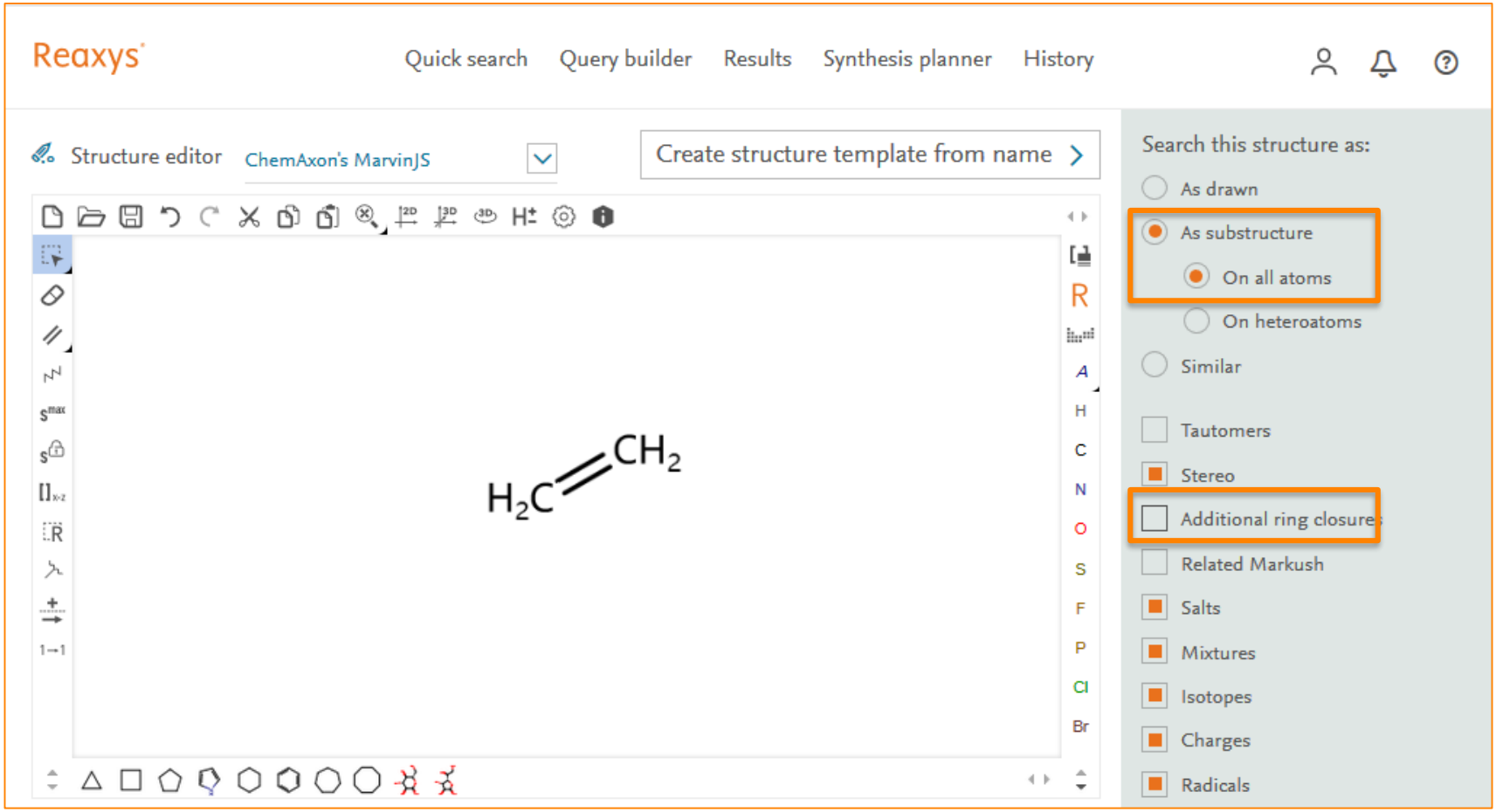
添加“机械属性”列表与结构属性



Tips：

通过Query Builder将结构和“机械属性”联合起来，点击结构添加“乙烯”

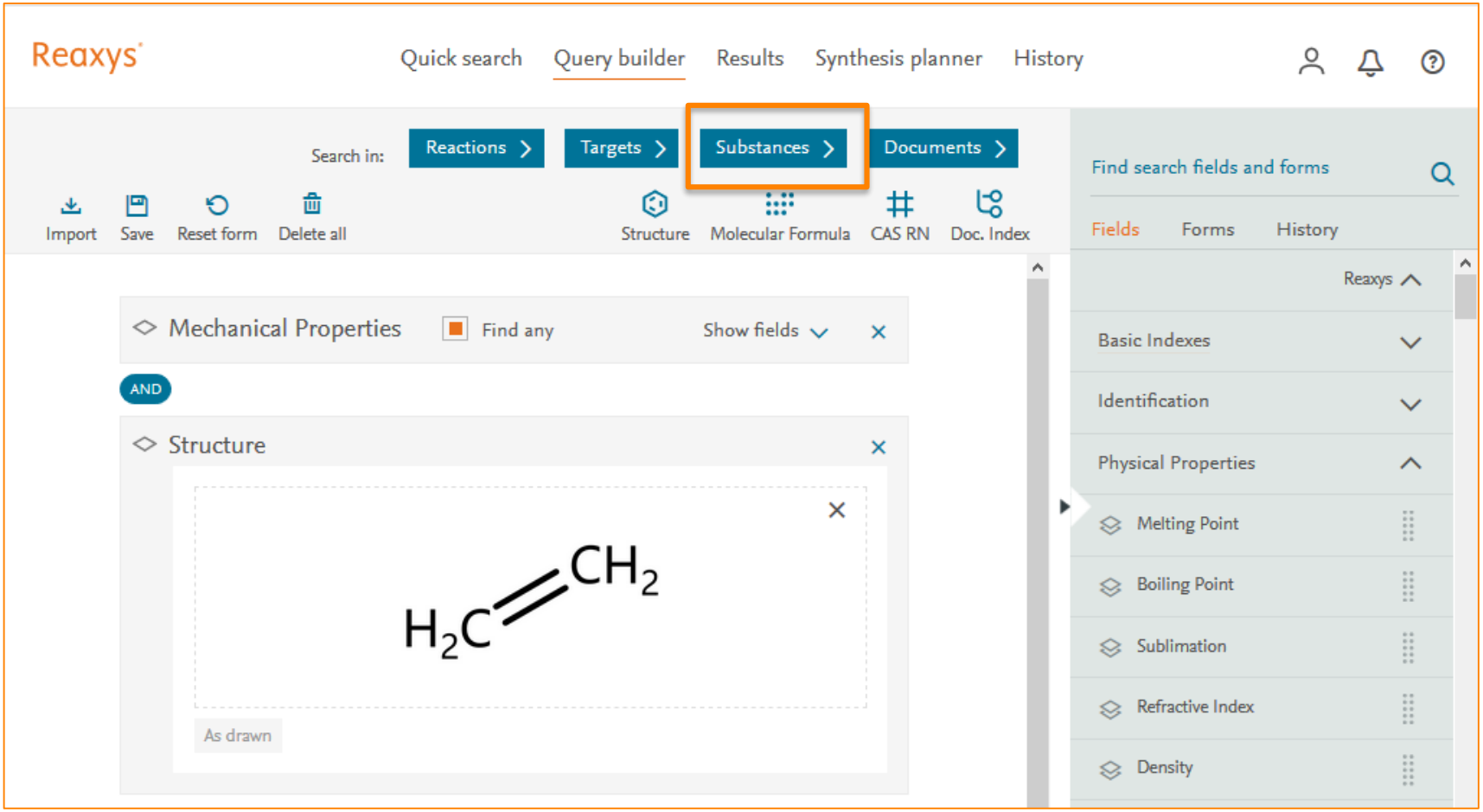
结构的绘制



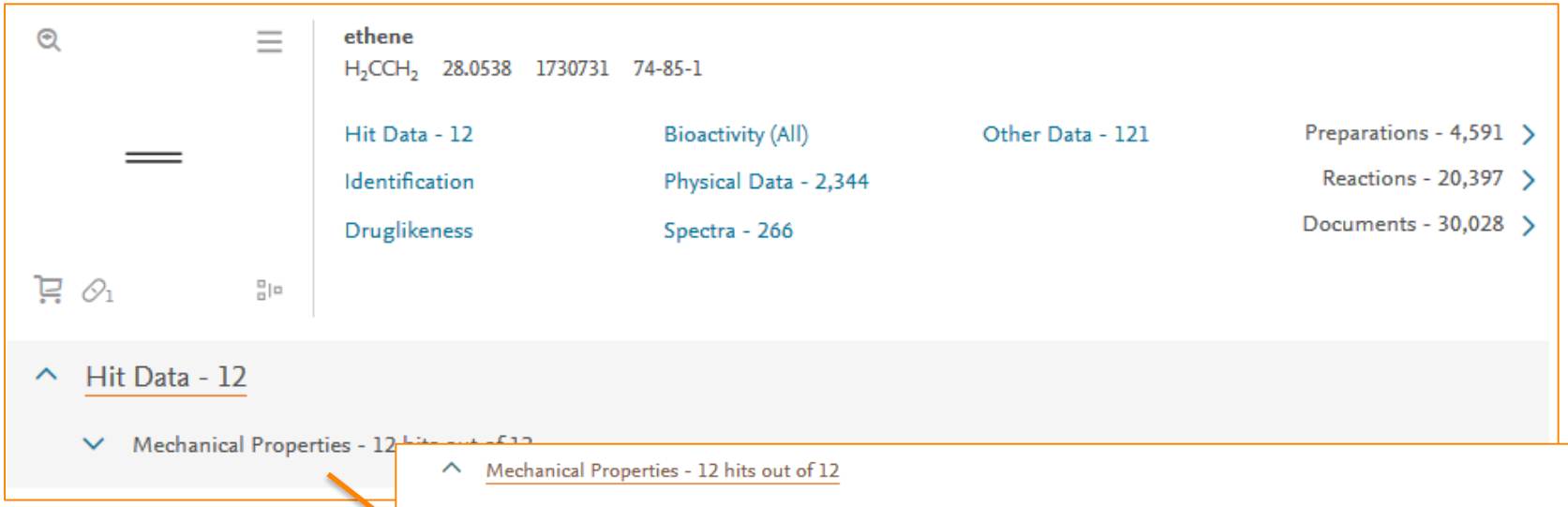
Tips：

亚结构检索确保是乙烯衍生物，Additional Ring Closure去掉确保不成环。

最后的检索式

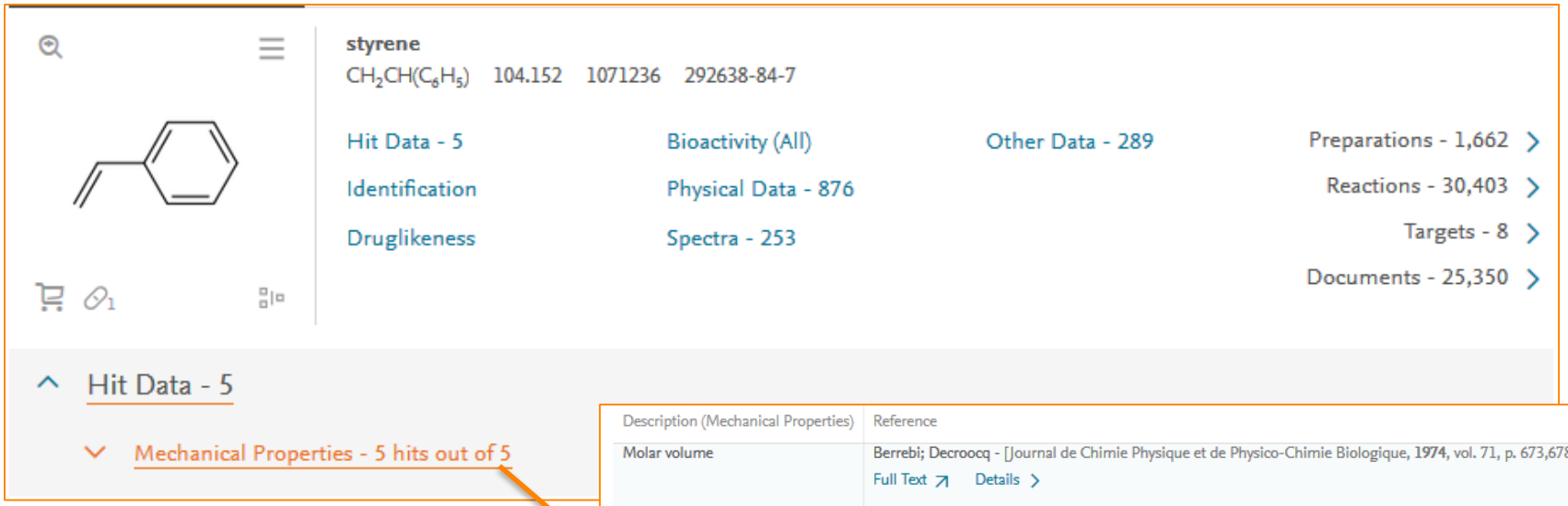

Reaxys
Quick search
Query builder
Results
Synthesis planner
History
Search in:
Reactions
Targets
Substances
Documents
Import
Save
Reset form
Delete all
Structure
Molecular Formula
CAS RN
Doc. Index
Find search fields and forms
Fields
Forms
History
Mechanical Properties
Find any
Show fields
AND
Structure
$H_2C=CH_2$
As drawn
Reaxys
Basic Indexes
Identification
Physical Properties
Melting Point
Boiling Point
Sublimation
Refractive Index
Density

最后的结果—乙烯的数据



不同文献中报道的关于“乙烯”的“机械属性”

最后的结果—衍生物的数据

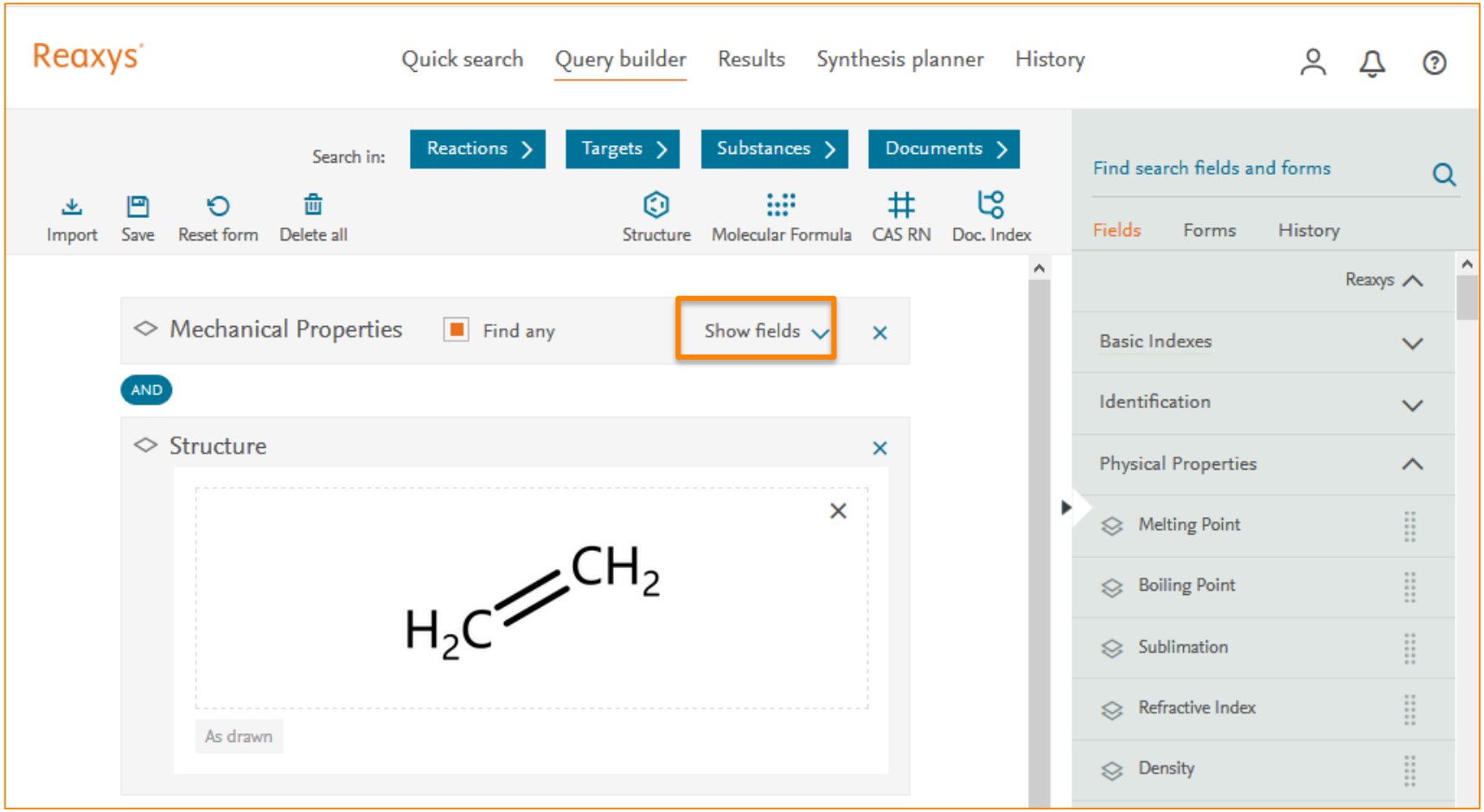


Description (Mechanical Properties)	Reference
Molar volume	Berrebi; Decroocq - [Journal de Chimie Physique et de Physico-Chimie Biologique, **1974**, vol. 71, p. 673,678] Full Text Details Miller et al. - [Journal of Chemical and Engineering Data, **1975**, vol. 20, p. 417,418, 419] Full Text Details Ghosal, Saswati; Samoc, Marek; Prasad, Paras N.; Tufariello, Joseph J. - [Journal of Physical Chemistry, **1990**, vol. 94, # 7, p. 2847 - 2851] Full Text Cited 101 times Details Abstract Hayduk, Walter; Minhas, Bhupender S. - [Journal of Chemical & Engineering Data, **1987**, vol. 32, # 3, p. 285 - 290] Full Text Details Abstract
Virial coefficients of the equation of state	Balashova, I. M.; Mokrushina, L. V.; Morachevskii, A. G. - [J. Appl. Chem. USSR (Engl. Transl.), **1989**, vol. 62, # 12, p. 2744 - 2750,2546 - 2551] Full Text Details Abstract
PVT Relationship	Sasuga et al. - [Journal of Physical Chemistry, **1979**, vol. 83, p. 3290] Full Text Cited 6 times Details
Compressibility	Yakusheva et al. - [Russian Journal of Physical Chemistry, **1977**, vol. 51, p. 973] [p. 1657] Full Text Details
Viscosity	Olaj - [Monatshefte fuer Chemie, **1971**, vol. 102, p. 648] Full Text Cited 3 times Details

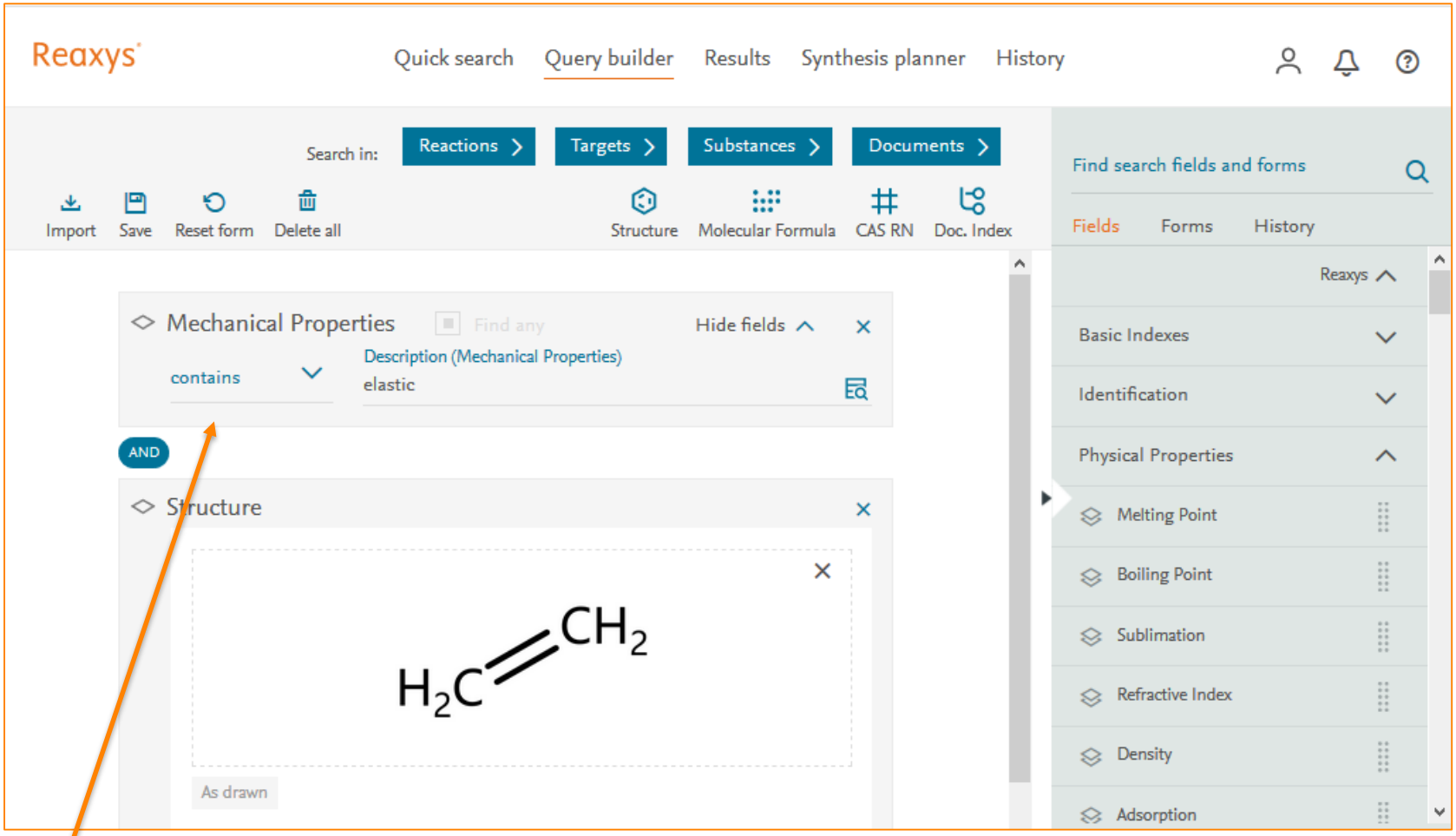
涉及到“苯乙烯”的摩尔体积，可压缩性，维里系数，粘性方面的报道

案例衍生—如果特指与“弹性”有关的性能报道

- 对于以下的检索，该如何修改



修改检索条件



注意修改成Contains, 并添加为“弹性”词条。

最后的结果

111 Substances out of 53,348 Documents, containing 25,663 Reactions, 275 Targets

Reaxys - 111

0 selected | Limit To | Exclude | Export | Sort by No of References | Grid | Heatmap

1

ethene

H_2CCH_2 28.0538 1730731 74-85-1

Hit Data - 1 | Bioactivity (All) | Other Data - 121 | Preparations - 4,591

Identification | Physical Data - 2,344 | Reactions - 20,397

Druglikeness | Spectra - 266 | Documents - 30,028

Hit Data - 1

Mechanical Properties - 1 hits out of 12

Mechanical Properties - 1 hits out of 12

Description (Mechanical Properties)	Reference
Elastic properties	Maksimkin, Aleksey; Kaloshkin, Sergey; Zadorozhnyy, Mikhail; Tcherdy S214-S217] Full Text Cited 15 times Details Abstract

2

cis-Octadecenoic acid

$C_8H_{17}CHCH(CH_2)7COOH$ 282.467 1726

Hit Data - 1 | Bioactivity (All) | Other Data - 1,028 | Preparations - 134

Identification

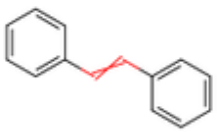
Druglikeness

Hit Data - 1

Mechanical Properties - 1 hits out of 6

Description (Mechanical Properties)	Reference
Elasticity constants	Bazaron et al. - [Sov. Phys. Dokl. (Engl. Transl.), **1973**, vol. 17, p. 1324,769] Full Text Details
	Bazaron et al. - [Sov. Phys. Dokl. (Engl. Transl.), **1973**, vol. 17, p. 1325,997] Full Text Details
	Bazaron et al. - [Sov. Phys. Dokl. (Engl. Transl.), **1965**, vol. 10, p. 799,134] Full Text Details

其中一个化合物—理化性质



stilbene

$C_6H_5CHCHC_6H_5$ 180.249 1904445 588-59-0

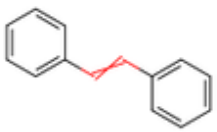
Hit Data - 1
Identification
Druglikeness
Bioactivity (All)
Physical Data - 157
Spectra - 139
Other Data - 56
Preparations - 638
Reactions - 1,022
Documents - 1,588

Physical Data - 157

- Melting Point - 38
- Boiling Point - 8
- Density - 1
- Adsorption (MCS) - 1
- Association (MCS) - 15
- Chromatographic Data - 3
- Conformation - 1
- Crystal Phase - 1
- Crystal Property Description - 7
- Decomposition - 1

Colour & Other Properties	Location	Reference
colourless		Potier, Jonathan; Menuel, Stephane; Rousseau, Jolanta; Tumkevicius, Sigitas; Hapiot, Frederic; Monflier, Eric - [Applied Catalysis A: General, **2014**, vol. 479, p. 1 - 8] Full Text Cited 11 times Details Abstract
yellow		Kireenko, Marina M.; Zaitsev, Kirill V.; Oprunenko, Yuri F.; Churakov, Andrei V.; Tafeenko, Viktor A.; Karlov, Sergey S.; Zaitseva, Galina S. - [Dalton Transactions, **2013**, vol. 42, # 22, p. 7901 - 7912] Full Text Cited 18 times Details Abstract
white	supporting information	Yang, Fu-Lai; Ma, Xian-Tao; Tian, Shi-Kai - [Chemistry - A European Journal, **2012**, vol. 18, # 6, p. 1582 - 1585] Full Text Cited 92 times Details Abstract
white		Ren, Gerui; Cui, Xiuling; Yang, Erbing; Yang, Fan; Wu, Yangjie - [Tetrahedron, **2010**, vol. 66, # 23, p. 4022 - 4028] Full Text Cited 48 times Details Abstract Lu, Jian-Mei; Ma, Hui; Li, Sha-Sha; Ma, Dan; Shao, Li-Xiong - [Tetrahedron, **2010**, vol. 66, # 27-28, p. 5185 - 5189] Full Text Cited 32 times Details Abstract Tang, Yi-Qiang; Chu, Chun-Yan; Zhu, Lei; Qian, Bin; Shao, Li-Xiong - [Tetrahedron, **2011**, vol. 67, # 49, p. 9479 - 9483] Full Text Cited 28 times Details Abstract

其中一个化合物—理化性质



stilbene

$C_6H_5CHCHC_6H_5$ 180.249 1904445 588-59-0

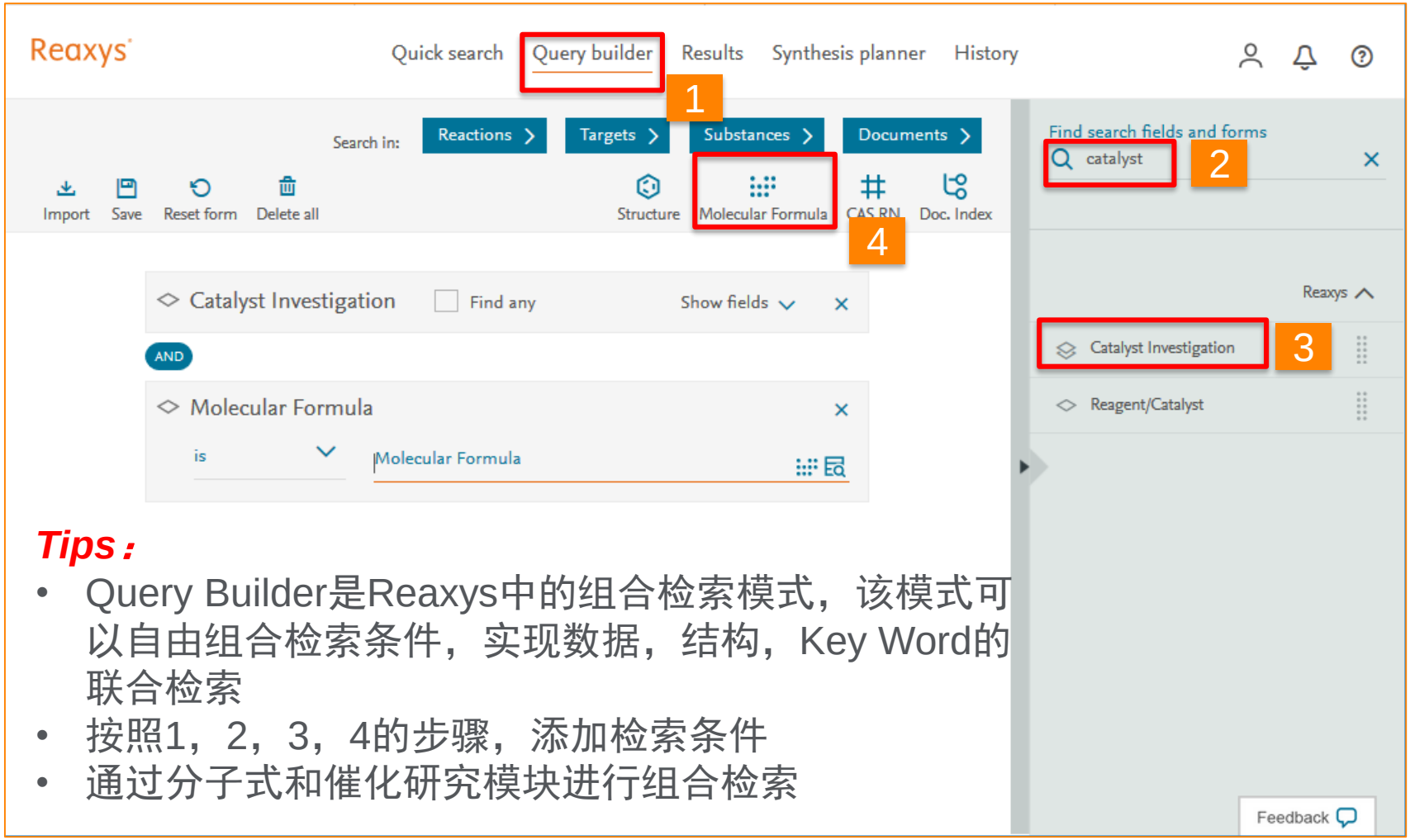
Hit Data - 1
Bioactivity (All)
Other Data -
Identification
Physical Data - 157
Druglikeness
Spectra - 139

Spectra - 139
- NMR Spectroscopy - 67
- IR Spectroscopy - 8
- Mass Spectrometry - 17
- UV/VIS Spectroscopy - 17
- ESR Spectroscopy - 2

Description (NMR Spectroscopy)	Nucleus (NMR Spectroscopy)	Coupling Nuclei	Solvents (NMR Spectroscopy)	Temperature (NMR Spectroscopy), °C	Frequency (NMR Spectroscopy), MHz	Original Text (NMR Spectroscopy)	Location	Comment (NMR Spectroscopy)	Signals, ppm	Kind of signal	Reference
shifts, Spectrum						MHz, $CDCl_3$) δ: 7.12 (s, 2H), 7.27 (t, J = 7.4 Hz, 2H), 7.37 (t, J = 7.4 Hz, 4H), 7.53 (dd, J = 1.4 and 8.4 Hz, 3H)	information				- [Tetrahedron, **2017**, vol. 73, # 27-28, p. Full Text Details Abstract
Chemical shifts, Spectrum	13C		chloroform-d1		125	^{13}C NMR (125 MHz, $CDCl_3$) δ: 127.4, 128.5, 129.5, 138.22	supporting information		127.4, 128.5, 129.5, 138.22		Tanaka, Chihiro; Nakamura, Kimiaki; Ni - [Tetrahedron, **2017**, vol. 73, # 27-28, p. Full Text Details Abstract

Case Study 3：“特定研究领域”的催化剂选择

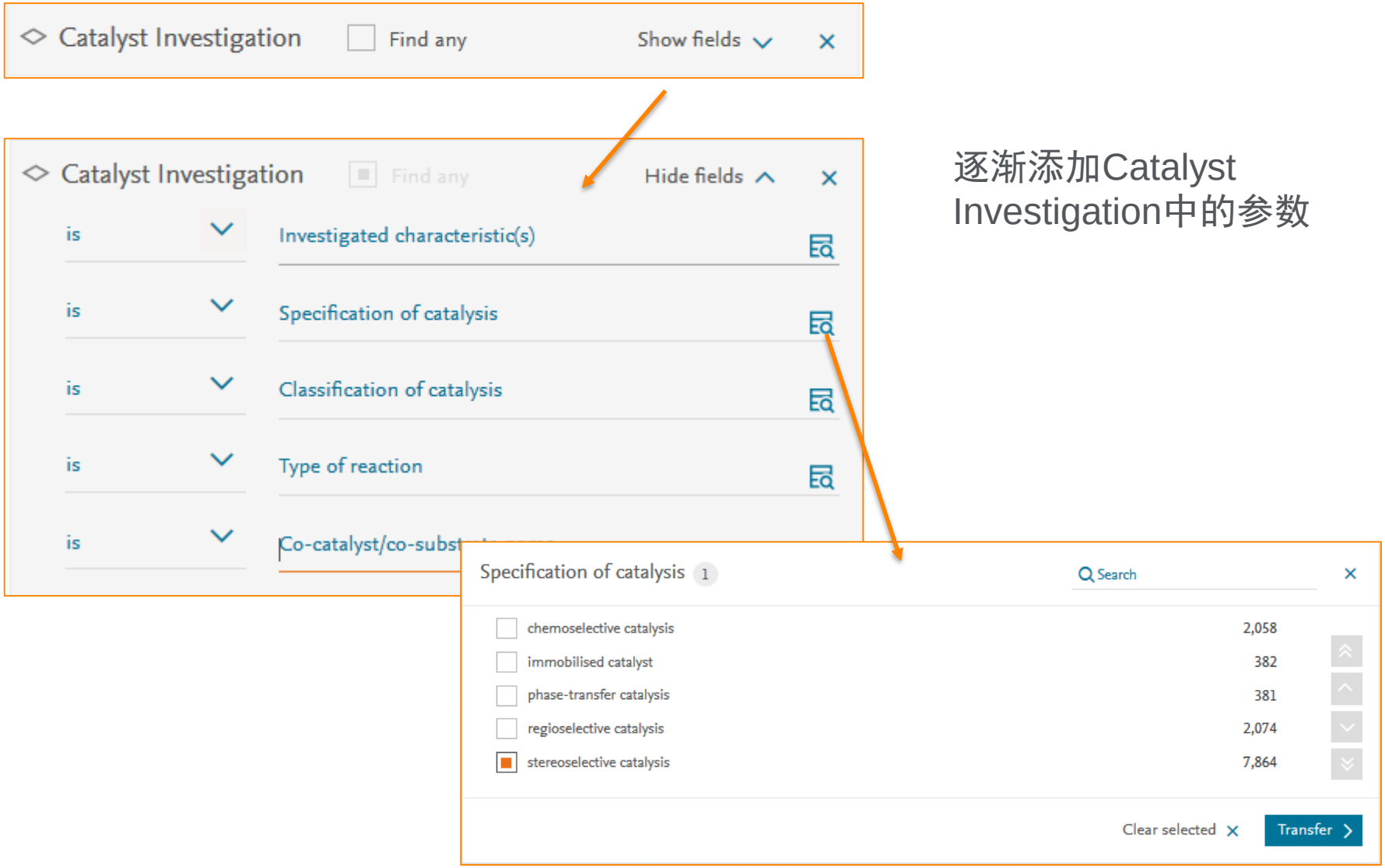
- 检索可用于立体选择性催化的含Fe的催化剂



Tips：

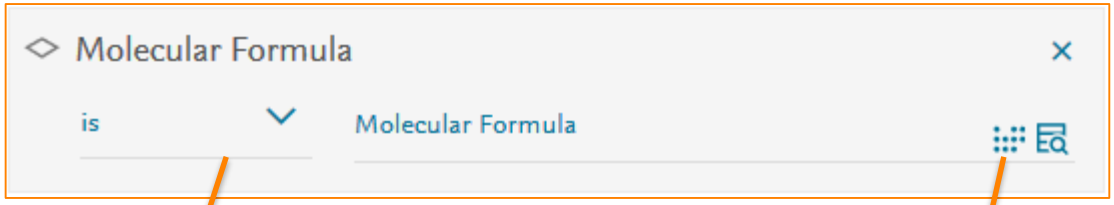
- Query Builder是Reaxys中的组合检索模式，该模式可以自由组合检索条件，实现数据，结构，Key Word的联合检索
- 按照1，2，3，4的步骤，添加检索条件
- 通过分子式和催化研究模块进行组合检索

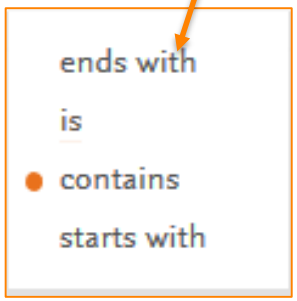
条件的逐渐添加—Catalyst Investigation

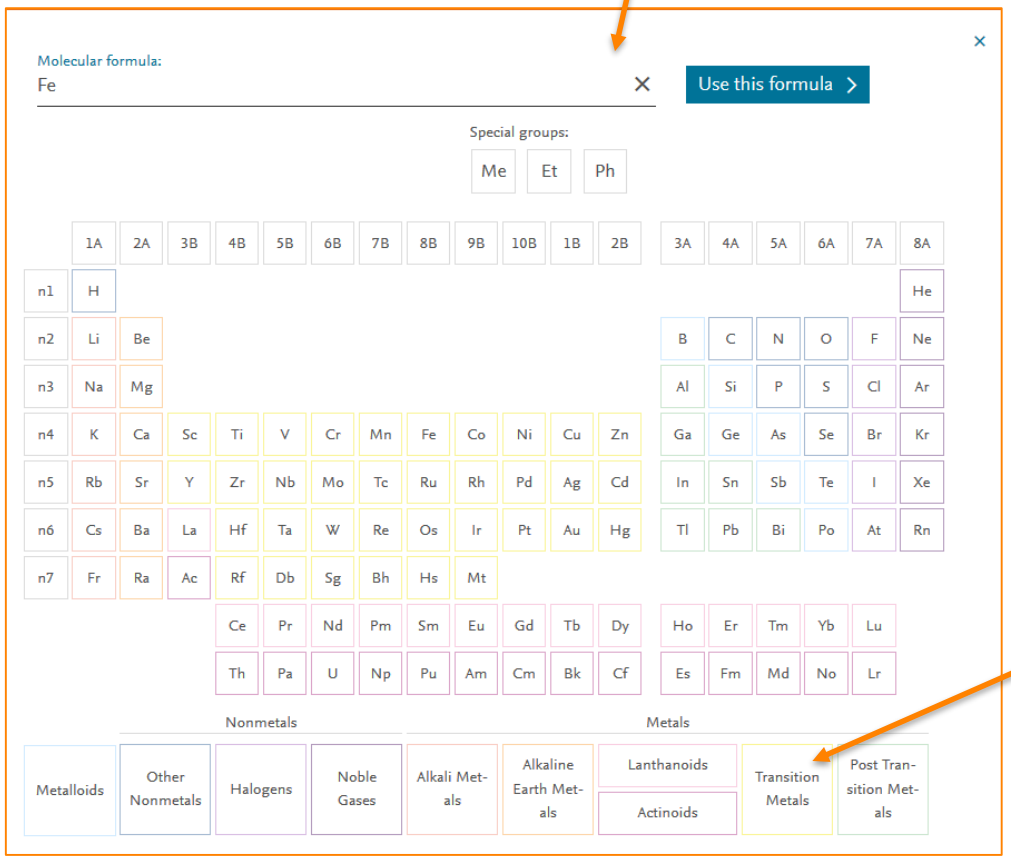


逐渐添加Catalyst Investigation中的参数

条件的逐渐添加—MF的添加







可以按照种类进行选择，过渡态金属，镧系金属等

完成的检索式

Reaxys

Quick search | Query builder | Results | Synthesis planner | History

Search in: Reactions | Targets | Substances | Documents

Import | Save | Reset form | Delete all | Structure | Molecular Formula | CAS RN | Doc. Index

Catalyst Investigation | Find any | Hide fields

is	Investigated characteristic(s)
is	Specification of catalysis stereoselective catalysis
is	Classification of catalysis
is	Type of reaction
is	Co-catalyst/co-substrate name

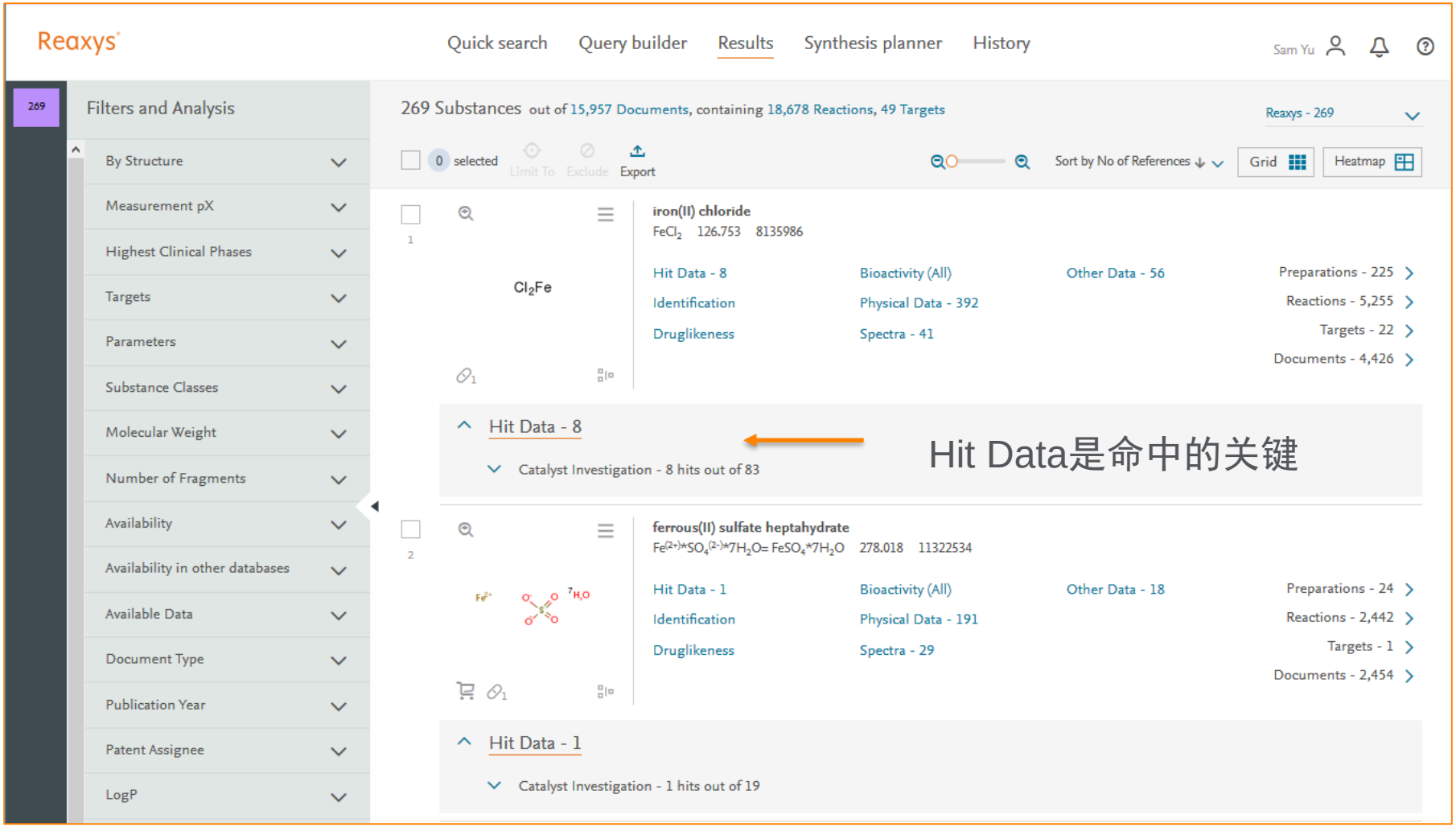
AND

Molecular Formula

contains	Molecular Formula Fe

物质检索

最后的结果


Reaxys
Quick search
Query builder
Results
Synthesis planner
History
Sam Yu
269
Filters and Analysis
By Structure
Measurement pX
Highest Clinical Phases
Targets
Parameters
Substance Classes
Molecular Weight
Number of Fragments
Availability
Availability in other databases
Available Data
Document Type
Publication Year
Patent Assignee
LogP
269 Substances out of 15,957 Documents, containing 18,678 Reactions, 49 Targets
Reaxys - 269
0 selected
Limit To
Exclude
Export
Sort by No of References
Grid
Heatmap
1
Cl2Fe
iron(II) chloride
FeCl2 126.753 8135986
Hit Data - 8
Bioactivity (All)
Other Data - 56
Preparations - 225
Identification
Physical Data - 392
Reactions - 5,255
Druglikeness
Spectra - 41
Targets - 22
Documents - 4,426
Hit Data - 8
Catalyst Investigation - 8 hits out of 83
Hit Data是命中的关键
2
ferrous(II) sulfate heptahydrate
Fe(2+)*SO4(2-)*7H2O= FeSO4*7H2O 278.018 11322534
Hit Data - 1
Bioactivity (All)
Other Data - 18
Preparations - 24
Identification
Physical Data - 191
Reactions - 2,442
Druglikeness
Spectra - 29
Targets - 1
Documents - 2,454
Hit Data - 1
Catalyst Investigation - 1 hits out of 19

其中一个化合物中的命中记录

269 Substances out of 15,957 Documents, containing 18,678 Reactions, 49 Targets

Reaxys - 269

0 selected Limit To Exclude Export

Sort by No of References Grid Heatmap

1

Cl_2Fe

iron(II) chloride
$FeCl_2$ 126.753 8135986

Hit Data - 8
Identification
Druglikeness
Bioactivity (All)
Physical Data - 392
Spectra - 41
Other Data - 56
Preparations - 225
Reactions - 5,255
Targets - 22
Documents - 4,426

Hit Data - 8

Catalyst Investigation - 8 hits out of 83

Show/Hide columns

Investigated characteristic(s)	Specification of catalysis	Type of reaction (Catalyst Investigation)	Location	Co-catalyst/co-substrate name	Reference
Catalytic activity, Diastereomeric excess	Stereoselective catalysis	Cross-coupling reaction			Hofmayer, Maximilian S.; Hammann, Jeffrey M.; Cahiez, Gérard; Knochel, Paul - [Synlett, 2018, vol. 29, # 1, p. 65 - 70] Full Text Details Abstract
Catalytic activity	Stereoselective catalysis	Silylation			Xu, Rui; Cai, Chun - [Catalysis Communications, 2018, vol. 107, p. 5 - 8] Full Text Details Abstract
Catalytic activity	Stereoselective catalysis	Silylation	supporting information		Lu, Shenglin; Tian, Tian; Xu, Ran; Li, Zhiping - [Tetrahedron Letters, 2018, vol. 59, # 26, p. 2604 - 2606] Full Text Details Abstract
Catalytic activity, Enantiomeric excess	Stereoselective catalysis			6,6′-bis[(S)-4-isopropyloxazolin-2-yl]-2,2′-bipyridine	Jalba, Angela; Régnier, Noémie; Ollevier, Thierry - [European Journal of Organic Chemistry, 2017, vol. 2017, # 12, p. 1628 - 1637] Full Text Cited 5 times Details Abstract
Catalytic activity	Stereoselective catalysis, Regioselective catalysis				Lingua, Hugo; Vibert, François; Mouysset, Dominique; Siri, Didier; Bertrand, Michèle P.; Feray, Laurence - [Tetrahedron, 2017, vol. 73, # 25, p. 3415 - 3422] Full Text Details Abstract

Feedback

Reaxys给出结果的逻辑是，先给答案，再给出支持答案的文献出处。

提纲

- 常见的与物质物质检索有关的困难案例
- Reaxys中的解决方案
  - Reaxys中的Query Builder检索模式
  - Reaxys中的困难案例解决方案
  - Reaxys中的更多与性质检索有关技巧
- Reaxys物质检索小结

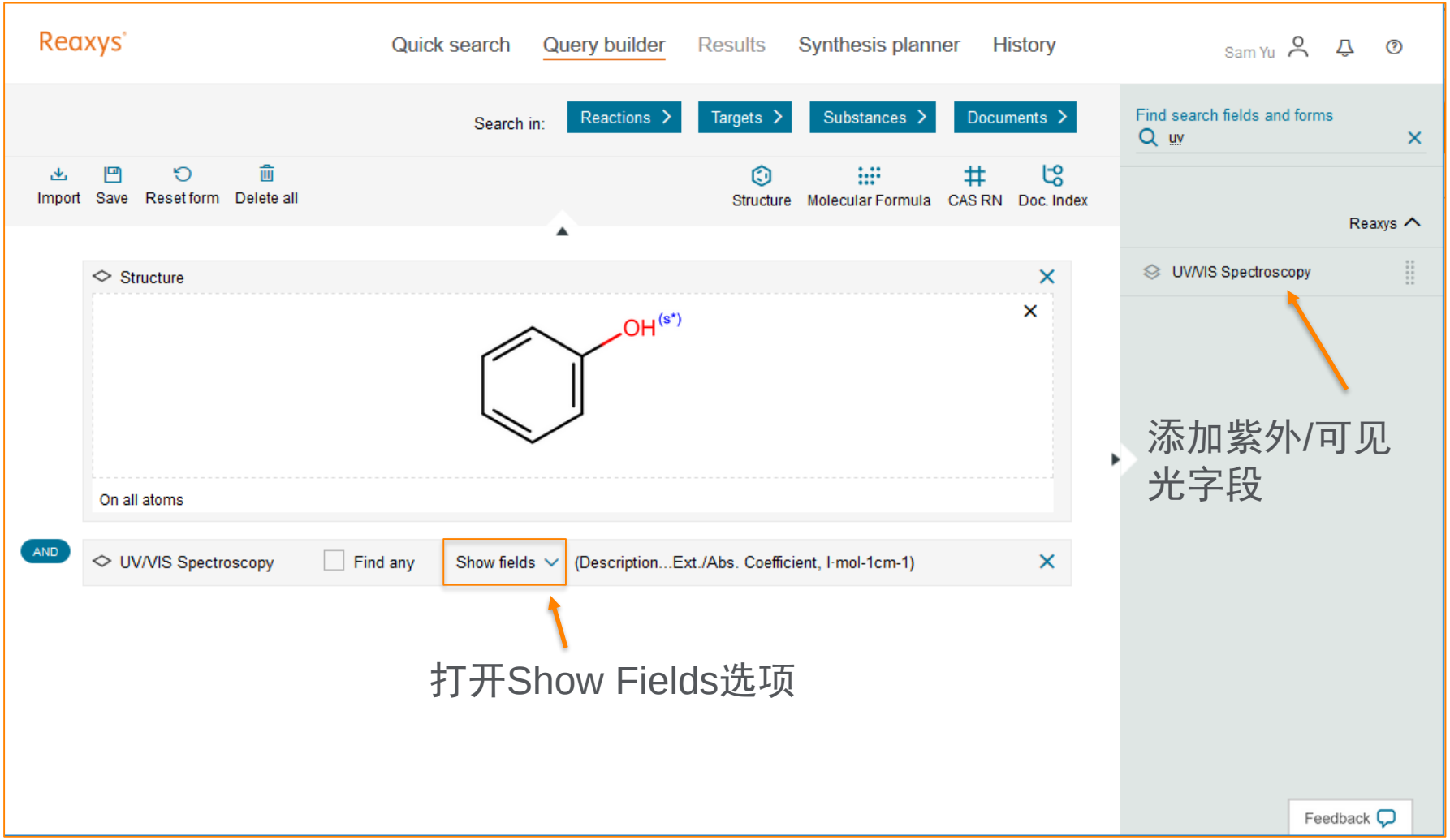
CASE 4:可见光下特定颜色化合物的查询

- 检索需求
  - 结构中包含苯甲醇片段
  - 显示为紫罗兰的化合物

检索前提：
一个化合物在可见光下显示什么颜色，需要知道他能吸收什么样的波长

波长（nm)	吸收颜色	可见颜色
400 ～ 450	紫	黄绿
450 ～ 480	蓝	黄
480 ～ 490	绿蓝	橙
490 ～ 500	蓝绿	红
500 ～ 560	绿	红紫
560 ～ 580	黄绿	紫
580 ～ 610	黄	蓝
610 ～ 650	橙	绿蓝
650 ～ 760	红	蓝绿

Query builder中创建检索式



打开Show Fields选项

添加紫外/可见光字段

完成具体的定义

Reaxys

Quick search | Query builder | Results | Synthesis planner | History

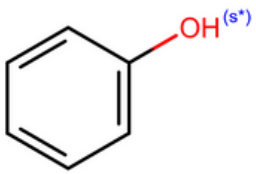
Sam Yu

Search in: Reactions > | Targets > | Substances > | Documents >

Import | Save | Reset form | Delete all

Structure | Molecular Formula | CAS RN | Doc. Index

Structure



On all atoms

AND

UV/VIS Spectroscopy | Find any | Hide fields

is	Description (UV/VIS Spectroscopy)
is	Solvent (UV/VIS Spectroscopy)
=	560-580
=	Ext./Abs. Coefficient, l·mol-1cm-1

Find search fields and forms

Fields | Forms | History

Reaxys

- Basic Indexes
- Identification
- Physical Properties
- Spectra
- MedChem
- Other
- Reactions
- Bibliography

PubChem

eMolecules

LabNetwork

Feedback

最后的结果

Reaxys

Quick search | Query builder | Results | Synthesis planner | History

Sam Yu

2.01 K
Query

Filters

Limit to | Exclude

- By Structure
- Measurement pX
- Highest Clinical Phases
- Targets
- Parameters
- Substance Classes
- Molecular Weight
- Number of Fragments
- Availability
- Availability in other data-bases
- Available Data
- Document Type
- Publication Year
- Patent Assignee
- LogP
- H Bond Donors

0 | Limit To | Exclude | Export | No of References | Grid | Heatmap

4

haematoxylin

$C_{16}H_9O(OH)5$ 302.284 1688573 1621-46-1, 17647-60-8, 98092-70...

Hit Data - 1
Identification
Druglikeness
Bioactivity (All)
Physical Data - 3
Spectra - 7
Other Data - 4
Reactions - 18
Targets - 7
Documents - 5,092

Hit Data - 1

UV/VIS Spectroscopy - 1 hits out of 1

5

trolox

$HOC(O)C_9H_4O(CH_3)4OH$ 250.295 5052542 56305-04-5, 53188-07-1

Hit Data - 1
Identification
Druglikeness
Bioactivity (All)
Physical Data - 48
Spectra - 32
Other Data - 80
Preparations - 15
Reactions - 625
Targets - 47
Documents - 4,219

Hit Data - 1

UV/VIS Spectroscopy - 1 hits out of 11

Feedback

CASE 5:化合物的文献定位

Tetrahedron 74 (2018) 224–239

Contents lists available at ScienceDirect

Tetrahedron

journal homepage: www.elsevier.com/locate/tet

Assessment of the regioselectivity in the condensation reaction of unsymmetrical *o*-phthaldialdehydes with alanine

Agathe C.A. D'Hollander, Nicholas J. Westwood*

School of Chemistry and Biomedical Sciences Research Complex, University of St Andrews and EaStCHEM, North Haugh, St Andrews, Fife, KY16 9ST, UK

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Keywords:
o-phthaldialdehyde
Condensation reaction
Regioselectivity
Mechanistic understanding

ABSTRACT

One approach for the synthesis of isoindolinones, a privileged bioactive heterocyclic core structure, involves a condensation reaction of *o*-phthaldialdehydes with a suitable nitrogen-containing nucleophile. This fascinating reaction is revisited here in the context of the use of *o*-phthaldialdehydes that contain additional substituents in the aromatic ring leading to a detailed analysis of the regioselectivity of the reaction. Eleven monosubstituted *o*-phthaldialdehydes were synthesised and reacted with alanine. The regioselectivity observed across the eleven substrates led to the design of a disubstituted substrate that reacted with very high control. A gram-scale reaction followed by esterification gave one major regioisomer in high yield. In addition, the regioselectivity observed on reaction of two novel mono-deuterated substrates led to an increased mechanistic understanding.

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1. Introduction

The isoindolinones make up an important class of bioactive molecules that includes the known drugs Pazinaclone (**1**),[1a] Indoprofen (**2**)[1b] and Chlorthalidone (**3**)[1c] (Fig. 1a).

Common methods of obtaining isoindolinones that are unsubstituted in the aromatic ring, for example compound **4** (Fig. 1b), include selective reduction of **5**,[2] reductive amination-cyclisation of **6**[3] or **7**[4] with a primary amine (RNH_2) and, of interest here, the condensation reaction of *o*-phthaldialdehyde (**8**) with a primary amine (RNH_2).[5,6a]

To date, the majority of studies performed on this condensation reaction have focused on evaluating the scope of the amine nucleophile that can be tolerated in the reaction[5a,5b,5d,6a,6b] and/or proposing potential reaction mechanisms.[5a,5b,6] In contrast, examples of the use of this condensation reaction with monosubstituted *o*-phthaldialdehydes are rare (SI1 part I). One report describes a regioselectivity of 1:1 for the products **11**:**12** resulting from the condensation of **9** with **10** (Scheme 1a).[7] However, the observed regioselectivity was measured only after filtration or purification by column chromatography. Isolated yields for the formation of a single isomer, **14** in most cases, resulting from the condensation of **13** with various amines have also been reported (Scheme 1b).[8]

Other studies have provided only isolated yield(s) after purification (for one or for each isomer), incomplete regioisomeric ratio (rr) data within a series or have claimed to form a single regioisomer (no yield provided) without discussing the other possible isomer (SI1 part I).[7–9]

The work reported here revisits this issue by presenting a detailed study of the regiochemical outcome of the condensation of alanine (**16**) with 3-monosubstituted *o*-phthaldialdehydes **17** (to give **18** and **19**, Scheme 1c) and with 4-monosubstituted *o*-phthaldialdehydes **20** (to give **21** and **22**, Scheme 1d). Based on the initial results, the design of a highly regioselective substrate was achieved consistent with an improved understanding of the reaction. Further mechanistic insights were provided by the use of novel mono-deuterated substrates.

2. Results and discussions

2.1. Synthesis of monosubstituted o-phthaldialdehydes

Five 3-substituted *o*-phthaldialdehydes **17a-e** were synthesised using 2–5 step routes involving either a Swern oxidation of the corresponding diol **23** or an acetal deprotection of the corresponding monoacetal **24** or diacetal **25** (Scheme 2 and SI1 part II.1 for more details). It should be noted that the synthesis of pure samples of **17a-e** was particularly challenging (in line with literature reports[10]) with significant decomposition occurring during purification attempts and on storage. In several cases freshly

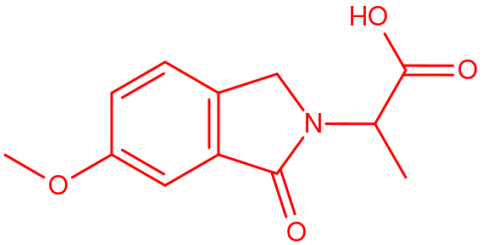
* Corresponding author.
E-mail address: njw3@st-andrews.ac.uk (N.J. Westwood).

https://doi.org/10.1016/j.tet.2017.11.035
0040-4020/© 2017 Elsevier Ltd. All rights reserved.

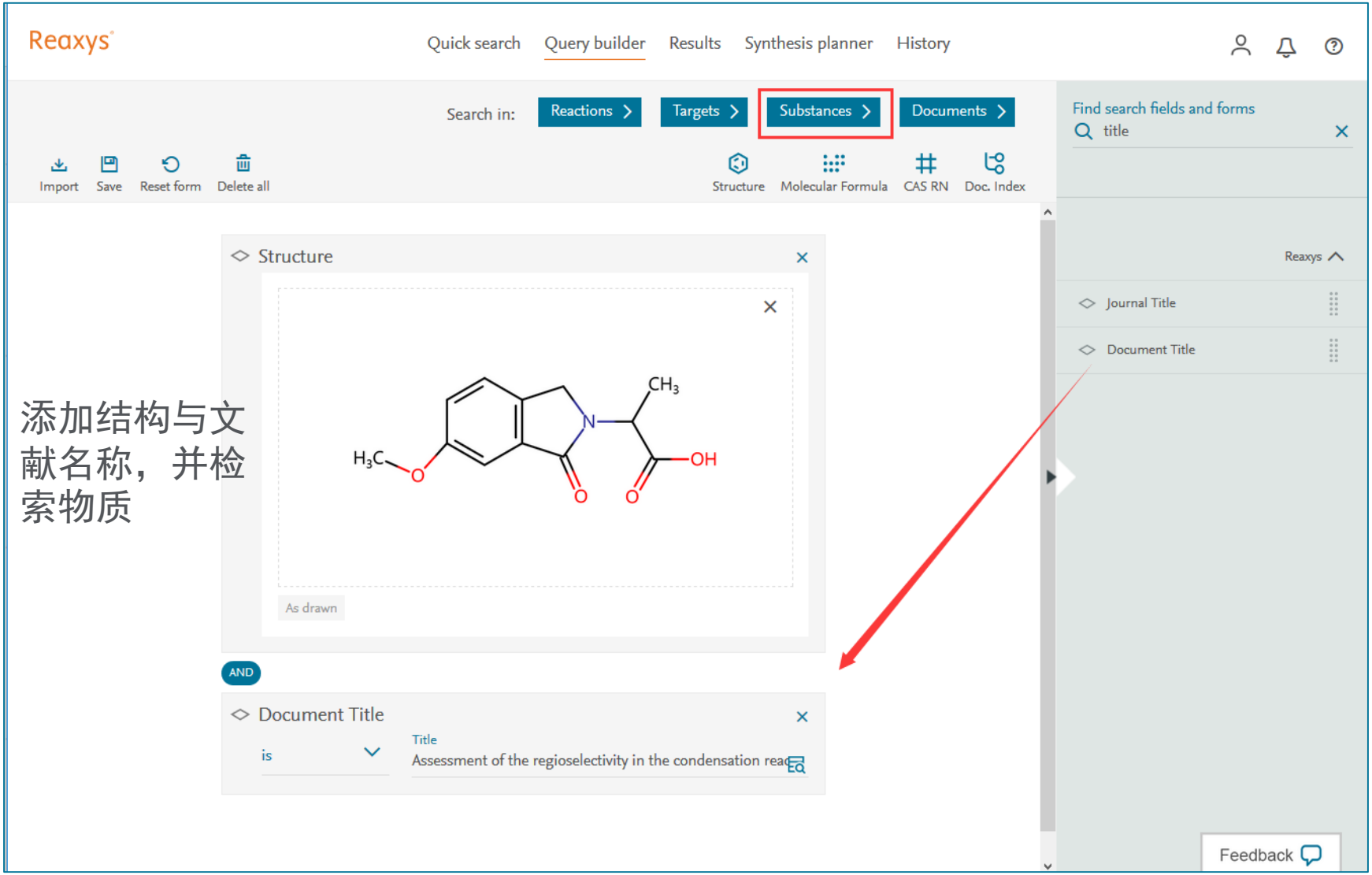
这是一篇常见的化学文献，包含：

1. 16页PDF全文
2. 2个Supporting Information的Word文档，一个是44页，一个37页

已知文献中报道了这个化合物，如何在上述的97页文档中找到有关这个化合物的描述？

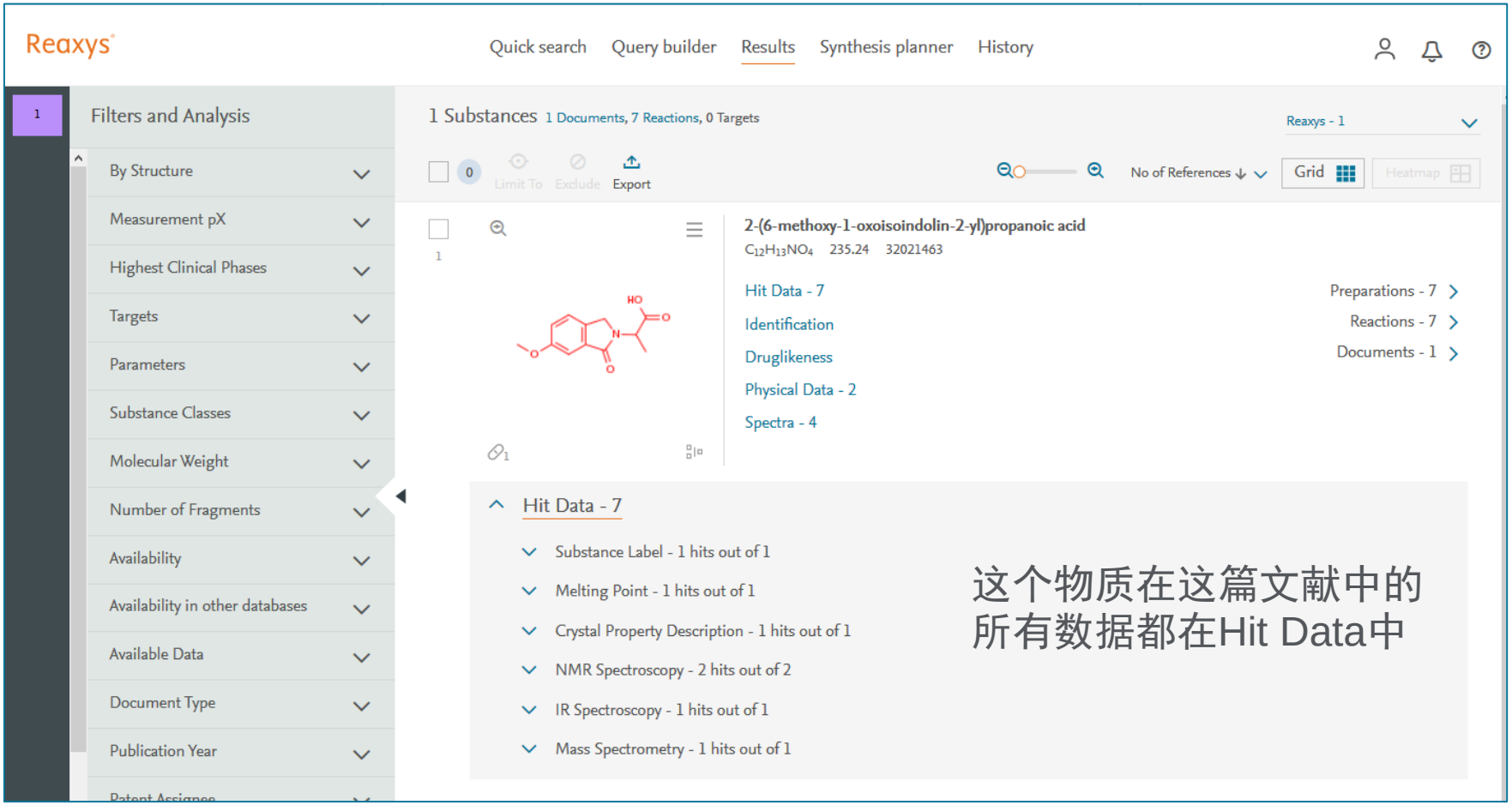


Query Builder下的检索方式



添加结构与文献名称，并检索物质

检索到的结果


Reaxys
Quick search
Query builder
Results
Synthesis planner
History
1
Filters and Analysis
By Structure
Measurement pX
Highest Clinical Phases
Targets
Parameters
Substance Classes
Molecular Weight
Number of Fragments
Availability
Availability in other databases
Available Data
Document Type
Publication Year
1 Substances 1 Documents, 7 Reactions, 0 Targets
Reaxys - 1
Limit To
Exclude
Export
No of References
Grid
Heatmap
2-(6-methoxy-1-oxoisoindolin-2-yl)propanoic acid
C12H13NO4 235.24 32021463
Hit Data - 7
Identification
Druglikeness
Physical Data - 2
Spectra - 4
Preparations - 7
Reactions - 7
Documents - 1
Hit Data - 7
Substance Label - 1 hits out of 1
Melting Point - 1 hits out of 1
Crystal Property Description - 1 hits out of 1
NMR Spectroscopy - 2 hits out of 2
IR Spectroscopy - 1 hits out of 1
Mass Spectrometry - 1 hits out of 1
这个物质在这篇文献中的
所有数据都在Hit Data中

关键性的标识性数据

Hit Data - 7

- Substance Label - 1 hits out of 1
- Melting Point - 1 hits out of 1
- Crystal Property Description - 1 hits out of 1
- NMR Spectroscopy - 2 hits out of 2
- IR Spectroscopy - 1 hits out of 1
- Mass Spectrometry - 1 hits out of 1

21a表示的是这个化合物在文献中的标识符。可以用21a对上述97页文档进行搜索，用于化合物定位

Label	Reference
21a	D'Hollander, Agathe C.A.; Westwood, Nicholas J. - [Tetrahedron, **2018**, vol. 74, # 2, p. 224 - 239] Full Text ↗ Details > Abstract >

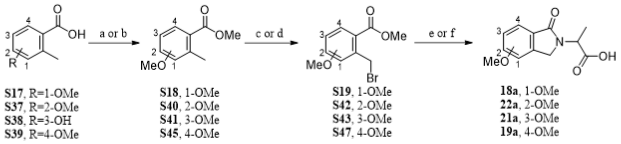
全文和Supporting Information中的搜索结果

2.2. Regioselectivity of the condensation reaction of mono-substituted o-phthaldialdehydes

The mono-substituted *o*-phthaldialdehydes **17a-e** and **20a-f** were refluxed for 4 h with alanine (**16**, 1.2 equivalents) in anhydrous acetonitrile before the reaction was concentrated *in vacuo*. The crude reaction mixtures (except when specified, Table 1) were then analysed using a quantitative ^{1}H NMR experiment. A baseline correction was applied using MestReNova-9 software and integrations were calculated relative to one proton on deconvoluted peaks (see Fig. 2 for an example of the analysis applied to the formation of **18a**/**19a** and SI1 part III.1 for the rest of the NMR analysis; also see the experimental section below for a detailed explanation of the analytical protocol used).

In two of the condensation reactions the structure of the major regioisomer was identified by comparison with the ^{1}H NMR spectrum of a pure sample of one of the regioisomers (for **18a**/**19a**, **21a**/**22a**, for the synthesis of authentic isomers see SI1 part III.2). In the rest of the cases, advanced NMR techniques (HSQC, HMBC, COSY) applied to the crude reaction mixture were used to assign the structure of the major regioisomer. Considering the analysis of the regioisomeric mixture of **18b**/**19b** as an example (Fig. 3), the proximity of a carbonyl was observed to shift the signal corresponding to the aromatic H7 proton in **18b** and the methyl H1′ protons in **19b** downfield (Fig. 3a and b). Identification of H7 in **18b** was further validated by its correlation with C1 in the HMBC analysis of the regioisomeric mixture (Fig. 3a). In contrast, H4 in **19b** showed a correlation with C3 in this HMBC analysis (Fig. 3c). Using the correlations observed in the COSY spectrum (Fig. 3d), the signals corresponding to H5 and H6 for **18b** and **19b** were finally assigned. The value of the integrals in the 1D quantitative ^{1}H NMR

- **III.2. Synthesis of pure isoindolinones 18a, 19a, 21a and 22a.**



Scheme S 10: Synthesis of **18a**, **19a**, **21a** and **22a**. Reagents and conditions: (a) MeOH, H_2SO_4, reflux, 7-24 h, quant. for **S18**, 84% for **S40**; (b) MeI, K_2CO_3, DMF, 70 °C 17-18 h, 92% for **S41**, 99% for **S45**; (c) NBS, AIBN, $CHCl_3$, reflux, 2.5-21.0 h, 97% for **S19**, crude **S42** and **S43** were directly used in the next step; (d) NBS, AIBN, CCl_4, reflux, 2 h, crude **S47** was directly used in the next step; (e) alanine (**16**), MeOH, K_2CO_3, reflux 19-21 h, 61% for **18a**, 55% (2 steps) for **19a**; (f) alanine (**16**), MeOH, NEt_3, reflux 2-23 h, 4% (2 steps) for **21a**, 4% (2 steps) for **22a**.

Esterification of **S17**, **S37**, **S38** and **S39** was achieved in excellent yield using iodomethane or methanol with sulfuric acid (Scheme S 10).[8] Radical monobromination[9] of **S18**, **S40**, **S41** formed **S19**, **S42**, **S43** which were directly reacted[9] with alanine (**16**) to obtain **18a**, **22a** and **21a** respectively. To investigate the poor yield over two steps (2% for **18a**, 4% for **21a** and 4% for **22a**), radical monobromination of **S18** was repeated and the succinimide side product from *N*-bromosuccinimide was removed by a basic wash using NaOH (1 M) leading to pure **S19** in 97% yield. Reaction of **S19** with **16** and NEt_3 afforded **18a** in only 8% yield. However, concentration of the aqueous phase showed **S44** as the major product (identified by NMR spectroscopy (Figure S 5) and supported by mass spectrometric analysis (**HRMS** (ES^+) *m/z* calculated for $C_{16}H_{26}NO_3$ $[M]^+$: 280.1907; found: 280.1910) along with the remaining NEt_3 and alanine (**16**). Formation of **S44** was prevented by reacting **S19** with K_2CO_3 instead of NEt_3 to provide **18a** in good yield. This optimisation could be applied for the synthesis of **21a** and **22a** but was not performed since sufficient material was available.

用于文献中化合物信息的快速定位。

提纲

- 常见的与物质物质检索有关的困难案例
- Reaxys中的解决方案
  - Reaxys中的Query Builder检索模式
  - Reaxys中的困难案例解决方案
  - Reaxys中的更多与性质检索有关技巧
- Reaxys物质检索小结

Reaxys物质检索小结

- Reaxys将文献和专利中报道的化合物中的关键数据全部抽提出来，有不同的字段对这些数据进行归类，充分了解这些字段的使用，可以快速获取关键信息

- Reaxys中的Query Builder可以帮助将不同的检索需求进行各种组合，帮助从不同角度获取物质信息，充分实现了多角度物质检索的需求

If you have questions feel free to reach out

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