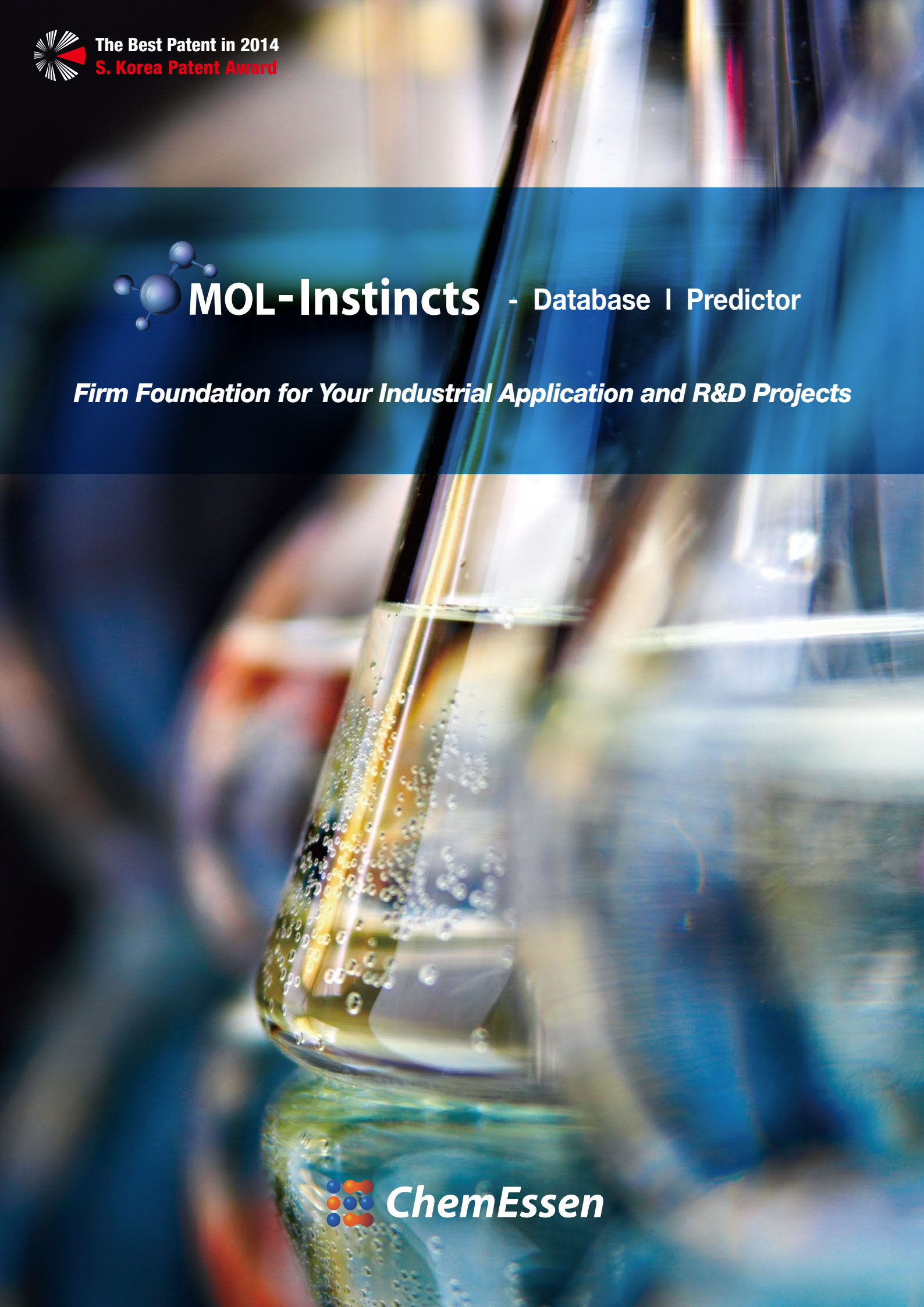

The Best Patent in 2014
S. Korea Patent Award
MOL-Instincts - Database I Predictor
Firm Foundation for Your Industrial Application and R&D Projects
ChemEssen

Mol-Instincts for Your Successful Chemical Application

What is Mol-Instincts?

A New Chemical Database

World's First chemical database based on Quantum Mechanics.

More than 2.85 Million Compounds, a Total of 10 Billion Sets of Data and Information

Over 2,100 sets of data are available for each and every 2.85 million compounds consisting of H, C, N, O, S, F, Cl, Br, I, Si, P, and As atoms.

Accuracy Level of Above 95%

The level of prediction accuracy by Mol-Instincts has been verified to be above 95% in most cases when compared with experimental data available to date (other existing mothod, e.g., Joback Method provides 63% of the accuracy level for boiling point prediction).

Free Trial for Individual and Organization

Free trial is available for anyone working in chemistry, chemical engineering, and medical researches when sign up at www.mol-in.com.

ChemEssen

Number of Chemical Compounds Available

Free Radicals

384,000+

Hydrocarbons

958,000+

Nonhydrocarbons

Hetero Compounds	1,510,000+
Halogen Compounds	50,000+
Extra-Hetero Compounds	10,000+

Drug-like Compounds

1,312,000+

Fuel Compounds

Gasoline	105,000+
Jet-Fuel	171,000+
Diesel	735,000+
Biodiesel	672,000+

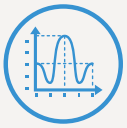
Chemical Processes

Soot Aromatic	248,000+
Naphta	273,000+
Combustion	1,349,000+
Thermal Cracking	491,000+
Catalytic Reforming	408,000+
Catalytic Cracking	798,000+
Hydro Cracking	768,000+
Desulfurization	1,012,000+
Isomerization	231,000+
GTL (Gas-To-Liquid)	858,000+
CTL (Coal-To-Liquid)	1,249,000+
MTO(Methanol-To-Olefin) / MTG(Methanol-To-Gasoline)	689,000+

Mol-Instincts will Make Your Work Brilliant.

MOL-Instincts

Mol-Instincts Information & Applications

Thermo-Physico-Chemical Properties		• Reaction engineering • Chemical process design / simulation / optimization • Energy efficiency improvement for combustion processes • Chemical safety and regulation
Quantum Data		• Optimized 3D molecular structure • Energy level comparison among other molecules • Speed up molecular optimization by starting from the Mol-Instincts 3D structure
Molecular Descriptors		• Obtaining descriptor values without running software • QSPR / QSAR modeling
Drug-Related Properties		• New drug discovery • Drug possibility provision
Spectra Data		• Application study with IR / NMR / VCD
Analysis Data		• Obtaining optimized molecular structure (2D/3D) • Vibrational frequency analysis & animation • Molecular orbitals (HOMO, LUMO)

Mol-Instincts Development Process *(40 Patented Technologies)*

Step 1

High Quality Quantum Calculation

Input structure for the quantum calculation was determined by conformer analysis – the most stable structure was used.

Step 2

Most Advanced QSPR Modeling

QSPR modeling was performed with more than 2,000 molecular descriptors which contains the quantum calculation results.

Step 3

Detailed Model Verification

Predicted data were compared and verified with the experimental data available to date (collected for more than 7 years), and the accuracy level of 95% was confirmed in most cases.

Step 4

Property Categorization

The Mol-Instincts database containing over 2,100 sets of data and information per compound for a variety of chemical compounds was constructed.

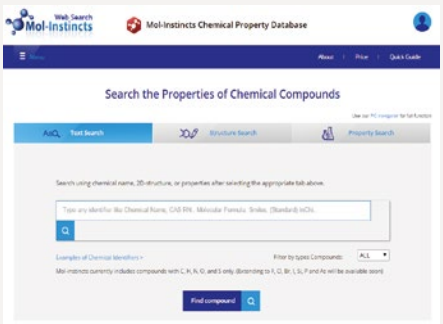
Mol-Instincts Comparison with Other DB Products

Mol-Instincts	DE*** DB	DI*** DB	SC*** DB	RE*** DB
Quantum/QSPR Prediction	Journal Collection	Journal Collection	Journal Collection	Journal Collection
Compounds ↑ 2,854,056+	Compounds ▬ 127,800+	Compounds ↓ 2,278+	Compounds ↑	Compounds ↑
Information ↑ 2,100+	Information ↓ 32+	Information ↓ 98+	Information ↓	Information ↓
Using Property Search			Using Journal Search	

How to Use Mol-Instincts Database

1

1. Visit http://www.mol-in.com.
2. Sign up for Free Trial (a 15-day for Individual & 30-day for Organization).

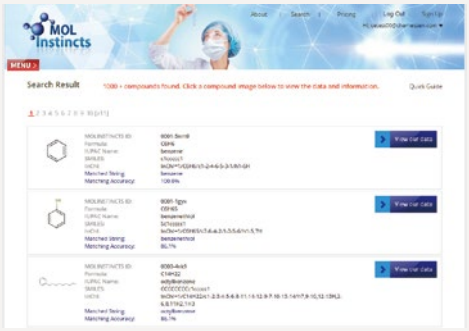


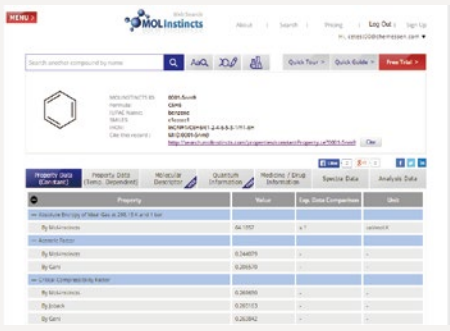
2

3. Visit http://search.mol-in.com, (Mol-Instincts web search).
4. Search target compound by text, 2D structure, or properties.

3

5. Click the most matched compound from the result list.
6. Similar compounds are also available along with matching accuracy.



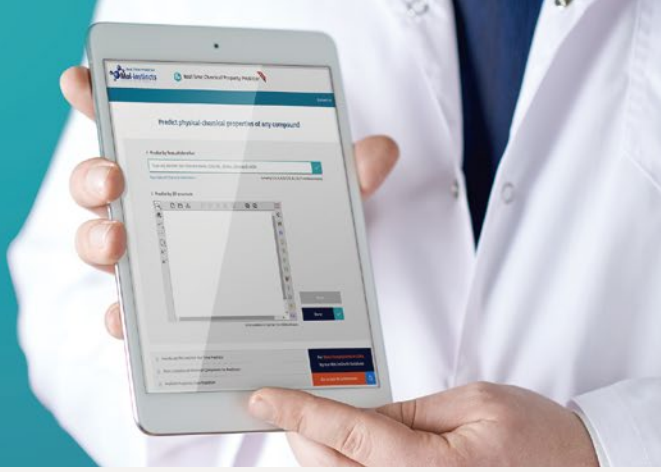


4

7. Seven different categories are available – simply select as needed
8. More than 2,100 sets of data and information per compound are available.

Mol-Instincts Real Time Chemical Predictor

A New Online Predictor Available for Free



What is Mol-Instincts Real Time Predictor?

Predict Property Values for Any Chemical Compound in Real-Time

In case the desired data is not available at Mol-Instincts database, Mol-Instincts Real Time Predictor will provide the data you want *via* the most advanced QSPR model calculation (predictable for chemical compounds containing C, H, N, O, S, F, Cl, Br, I, Si, P or As atoms).

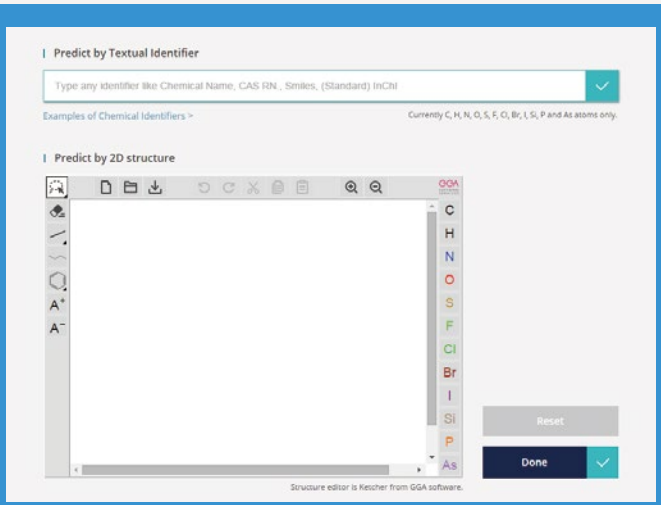
Free for Anyone for a Limited Time

You don't even need signup. There is no limitation or obligation.

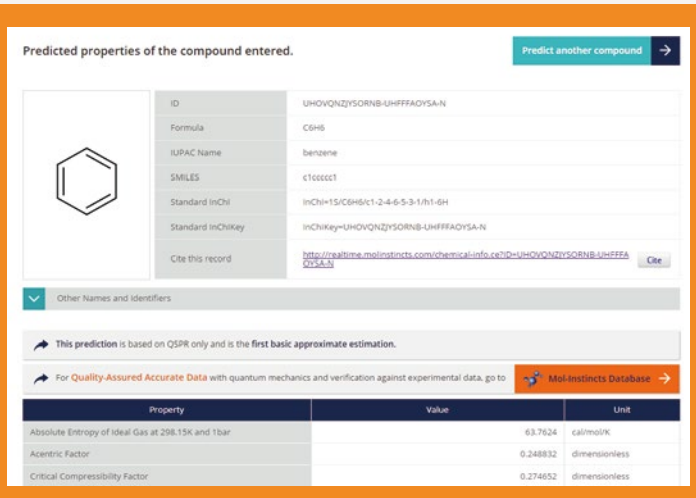
One-Click Prediction

Simply input your chemical compound and obtain various property data instantly. It can be done with just one-click on the website, and the property data can be used for the various applications right away.

How to Use Mol-Instincts Real Time Predictor



1. Visit http://realtime.mol-in.com.
2. Define & input your compound.



3. Obtain various physico-chemical properties.
4. A link button to the Mol-Instincts database is provided in case the input compound is available in Mol-Instincts database.

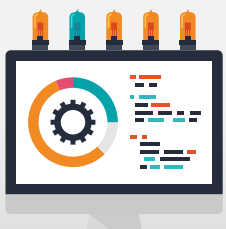
ChemEssen

ChemEssen provied revolutionary scientific products and services for chemical industries.

- **2006** Foundation of ChemEssen Inc.
- **2007** Establishment of company-affiliated research institute
- **2008** Awarded Innovative Technology Development Project granted by Small and Medium Business Administration (SMBA)
- Certification for Venture Business (Small and Medium Business Administration)
- **2009** Awarded Innovative Technology Development Project granted by SMBA
- **2010** Launched the Beta version of Mol-Instincts Database (PC Navigator version)
- **2011** 41 Patents granted
- Received foreign direct investment from China
- **2012** Registered trademark of ChemEssen for Domestic/Overseas
- PCT International Patent granted
- **2013** Launched Mol-Instincts Database (PC Navigator version)
- **2014** Awarded Grand Prize for the Best Patent in 2014 by the Korea Times
- Launched Mol-Instincts Web Search (web version)
- **2015** Updated Mol-Instincts DB with over 2.7million compounds / Cooperation with the Korea University (CHERIC)
- Launched Real Time Predictor
- Processing DB update on extended atoms (F, Cl, Br, I, P, Si, and As)

MOLECULAR OPTIMIZATION

DATA ANALYSIS



DATA PROCESSING

Mol-Instincts **Database** -
http://search.mol-in.com

Mol-Instincts **Real Time Predictor** -
http://realtime.mol-in.com

ChemEssen

www.ChemEssen.com

Mol-Instincts is a trademark of ChemEssen, Inc. This product is based on a technology that is the subject matter of a number of patent applications.

KOREA

812, 8th Flr. AceHighTechCity 2-Cha,
25 Seonyu-ro 13-gil, Yeongdeungpo-gu,
150-096 Seoul, S.Korea

T: +82-2-3143-5933
F: +82-2-3143-5920
E: staff@chemessen.com

USA

ChemEssen, INC. Suite 1677,
1321 Upland Drive, Houston,
TX 77043 U.S.

T: +1-800-413-5613
F: +1-800-413-5613
E: staff@chemessen.com

CHINA

KOTRA 3110, Maxdo Center,
8 Xingyi-Road, Shanghai,
China

T: +86-21-5108-8771(Ext.170)
M: +86-151-2118-1868
E: china@chemessen.com