



High Performance Discovery Software

FAQs (*frequently asked questions*)

SysChem as a Business

What, exactly, is SysChem selling?

SysChem is selling information that saves chemical companies money. SysChem's product is less expensive methods for manufacturing almost any synthetic organic molecule.

How does SysChem process an order?

SysChem acts as an organic chemistry service bureau. Customers order a molecule from SysChem via the Internet. Once payment terms are negotiated, SysChem performs an automated retrosynthesis of the molecule. SysChem then produces a categorized collection of possible production paths for synthesizing the molecule, utilizing commonly available materials and proven chemical reactions.

What will the customer receive from SysChem?

The customer receives a selection of the best manufacturing methods for whichever molecule(s) it chooses to submit.

What does the customer do with the results?

The customer chooses the manufacturing pathway that works best for its purpose. The solution is owned exclusively by the customer that purchased it. The customer may then apply for a patent on that process.

The SysChem Product

Is SysChem selling a software package?

No. Companies wishing SysChem services will not license or own software produced and sold by SysChem. Companies send an image of the molecule to SysChem. SysChem runs the molecule through its proprietary software to find the best manufacturing method. The company receives the answer, which it can examine and manipulate through a free viewer provided by SysChem. The client can process and store the data received in any form it wishes, using its own commercial or proprietary software.

How fast can SystematiChem© process a molecule?

Currently, SysChem can process a molecule in fewer than 24 hours and have the full detailed results ready for shipping to the customer within 7 business days.

Are there plans to decrease the time needed to process a molecule?

SysChem plans to acquire faster computers and is improving its software to reduce both processing and turn-around times for a molecule. SystematiChem©, SysChem's revolutionary processing system, is constantly being upgraded.

How many orders can SystematiChem© process a day?

As of today, SysChem can process 10 different molecules in one day. Planned hardware upgrades will increase capacity to 120 different molecules per day.

Why would the customer want to sort through (potentially) thousands of manufacturing pathways?

Given the high cost and unwieldy nature of current retrosynthesis techniques, having thousands of valid choices is actually a very good thing. Most chemists would be delighted to be able to pick and choose between novel solutions that work. If the chemist wants the manufacturing path requiring the fewest reactions, it is there to choose. If the chemist is looking for something truly creative, SysChem offers options for the scientist to choose between.

How does SystematiChem© guide the customer to the best answer?

SystematiChem© software currently does much more than provide a collection of workable manufacturing pathways. SystematiChem© sorts all syntheses by the number of chemical

reactions required to complete them, placing the very best syntheses at the top of the list. SysChem is currently upgrading SystematiChem© to order each of the valid syntheses by the cost per mol of the final product. This upgrade will be available no later than the first quarter of 2007.

The Science behind the Product

What is a “molecule?”

A molecule is a collection of connected atoms, the most basic building blocks. A molecule can be simple or complex. In the end, all a prescription drug is, is a complex molecule, produced and marketed by a pharmaceutical house.

What is a “manufacturing process?”

A manufacturing process is systematically creating the target molecule (e.g., a prescription drug) by doing a step-by-step construction from simpler building block molecules. Each combination of these building block molecules requires a chemical reaction, which is like the glue that holds them together.

Why is SysChem concerned with reaction costs?

Manufacturing processes can be evaluated by yield or by cost. Traditionally, chemists focus on yield. Cost is the better predictor of savings. SystematiChem© makes it easier to calculate cost.

What do we mean when we say “a molecule is a molecule?”

By definition, all organic molecules must contain at least one carbon atom (ordinarily many of them). The chemistry for making all organic molecules is the same no matter whether the ingredients are “natural,” synthetic, or a combination of the two. There are many ways to manufacture a complex molecule. Once the molecule has been created for a particular purpose or use, how it was created is irrelevant.

What is synthesis?

Synthesis means putting together. Organic synthesis is the construction of organic compounds, which are any of a large class of natural and man-made substances that contain the element carbon. Organic compounds are the basis of biochemistry and organic chemistry.

What is retrosynthesis?

Developing a synthesis route or plan for a desired compound is referred to as retrosynthesis. The organic chemist works backwards from the desired target compound using known reactions until he/she arrives at available starting materials. SysChem is the first company to effectively automate this process.

The Computing Behind SystematiChem©

Will the customer have access to the source code?

No. The software is proprietary and closely guarded to discourage pirating.

What programming language are you using?

Although the software itself will never be released, we are currently using three different computer languages, which are Delphi, C#, and SQL.

What is the platform?

The current platform is Windows XP, which may change to Linux at some point in the future.

Do you hold patents on your product?

Although there are nine major technological breakthroughs in this software, SysChem chooses not to patent any of them, as software is far too easy to pirate once its details are revealed in a patent application. SysChem's edge is its overall approach to retrosynthesis. It will keep that edge by actively engaging its customers, and constantly improving the product.

Why Should a Customer Do Business with SysChem?

What exactly is it that SysChem provides that has value to a customer, and how is that value determined?

SysChem's software, SystematiChem©, provides syntheses that can easily cut manufacturing costs in half or more for most organic molecules produced today. There are no gimmicks or spin. These are not "anticipated" savings. There are no additional steps required to achieve optimum savings. The customer will be able to independently calculate tangible cash savings to the bottom line.

In addition to distinguishing potential manufacturing processes by number of steps, will SystematiChem© tell the customer which manufacturing process is least expensive?

Upgrades to SystematiChem© will sort results by cost per mol of the finished product. For US manufacturers, this will offer reliable information that could be used to patent the lowest cost process. Companies located in different parts of the world will have different advantages and disadvantages in manufacturing such as labor costs, environmental issues, government regulation, etc. For these manufacturers, SystematiChem© will still offer a good place to start.

Do you have independent test results?

Yes.

What guarantee is there that SystematiChem© actually works?

The end deliverable is remarkably straightforward. The customer receives a collection of pathways by which a desired molecule may be synthesized. The components are commonly used and available on the open market. All the reactions are proven and accepted by chemists worldwide.

No one disputes the value of retrosynthetic analysis. By automating the process, SysChem is simply making a valuable tool cost-effective.

What if the customer doesn't like the results?

SysChem expects to make sales through nurtured relationships with decision makers in reputable companies. As a consequence, SysChem anticipates an initial sales cycle that includes time for the customer to determine the usefulness of the product.

If the customer determines that SysChem's results for a particular molecule have no value, SysChem will reclaim the rights to the molecule and void the sale. SysChem is prepared to risk an occasional pirated molecule in the name of customer satisfaction.

Why Is SysChem a Good Investment?

What pressing industry problem does SystematiChem© solve?

Everyone agrees retrosynthetic analysis is the key to more efficient manufacture of organic compounds. To date, no one has figured out how to do it quickly, accurately and inexpensively. The result is that companies routinely spend 2-10 times more on manufacturing costs than is necessary. That reduces profits, increases prices to end-users, or both. With increased government regulation – including prescription price controls – on the horizon, the company that can painlessly reduce costs and increase profits will have the edge.

Why didn't someone else do it first?

Many of the larger pharmaceutical and chemical companies have been trying to do this for at least two decades. There are many reasons they have not succeeded.

From the perspective of the inventor of SystematiChem©, one big reason companies failed to solve this problem is because they are thinking like chemists. The real problem is the gap between the ways chemists view the world and how computers process information. The solution to bridging the gap is 90% mathematical.

Mastering the puzzle is something best done by a marriage of the right group of scientific entrepreneurs. That's why SysChem got there first. It is why SysChem will retain its edge.