GREEN ALTERNATIVES
WIZARD HELP GUIDE

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1. PURPOSE OF THE DATABASE

The Green Alternatives Wizard is a database designed to provide easy and quick access to information about available chemical alternative to hazardous solvents. It was designed with the understanding that finding the ideal, green drop-in replacement for hazardous solvents does not work for every situation. The alternatives provided, however, do present a starting point for researchers to consider alternative methods to their own research that would reduce, if not eliminate, the use of a particular hazardous solvent. In many instances, the alternative chemicals or processes provided still have their own disadvantages that need improvements—as such, information about the advantages and disadvantages of chemical alternatives are also provided.
A user can search by Chemical to Replace, Process to Replace (or modify), Alternative Chemical, or Alternative Process.

**Chemical to Replace.** By initially choosing a *Chemical to Replace*, clicking *Continue*, selecting a chemical from the drop-down menu, and clicking *Continue*, the database returns a result list of possible alternative chemicals and/or alternative processes that can be used to eliminate or reduce the use of the chosen chemical.

- For example, choosing carbon tetrachloride as a *Chemical to Replace* would return a list of alternative chemicals or processes that could be used to reduce, if not eliminate, the use of carbon tetrachloride.

**Process to Replace.** By initially choosing *Process to Replace*, clicking *Continue*, selecting a process from the drop-down menu, and clicking *Continue*, the database returns a result list of possible alternative chemicals and/or alternative processes that can be used to avoid or modify the process to avoid hazardous conditions or reduce the use of hazardous chemicals.

- For example, choosing flash chromatography as a *Process to Replace* would return a list of alternative chemicals or process that could be used to either avoid the use of flash chromatography or reduce the generation of hazardous wastes from flash chromatography.

**Alternative Chemical.** By initially choosing *Alternative Chemical*, clicking *Continue*, selecting a chemical from the drop-down menu, and clicking *Continue*, the database returns a search list of the chemicals and/or processes that can be replaced or modified by the chosen *Alternative Chemical."

- For example, choosing ionic liquids as an *Alternative Chemical* would return of a list of the chemicals and processes that can be replaced or modified by ionic liquids to reduce, if not eliminate, the use of hazardous chemicals.

**Alternative Process.** By initially choosing *Alternative Process*, clicking *Continue*, selecting a process from the drop-down menu, and clicking *Continue*, the database returns a search list of the chemicals and/or processes that can be replaced or modified by the chosen *Alternative Process."

- For example, choosing solvent-free reactions as an *Alternative Process* would return a list of the chemicals and processes that can be replaced or modified by a solvent-free reaction to reduce, if not eliminate, the use of a hazardous solvent.
3. HOW THE DATABASE WORKS

Information in this database is inputted based on the reference information available for a certain chemical or process. All references associate a chemical or process with an alternative. As such, a search starting at Chemical to Replace or Alternative Chemical may return the same references.

Drop-down menus: Information for alternatives for a certain chemical or process, are predetermined and accessed through a drop-down menu. The drop-down menu appears after choosing a method to search, i.e. Chemical to Replace, Process to Replace (or modify), Alternative Chemical, or Alternative Process. When a chemical or process is selected, click Continue.

Search results list: The Search Results page returns a list of chemicals and processes that have been associated through the chosen chemical/process through a reference. Choosing a chemical or process from a drop-down menu in a search by Chemical to Replace or Process to Replace returns a search results list of possible alternatives identified through one or more references. Choosing a chemical or process from a drop-down menu in a search by Alternative Chemical or Alternative Process returns a search results list of the chemicals or processes that the chosen alternative can be used to replace.

Descriptions: By clicking on the chemical or process within the Search Results list, the descriptions of the chemical or process appear in the right-side window. The pros and cons of alternative chemicals are also included in the description.

Get References: Clicking on Get References returns a list of the titles of references under the Relevant References window on the left side of the screen. These references specifically associate an alternative with a chemical or process.

Reference Description: By clicking on a reference title listed under Relevant References, full reference details appear in the right-side window. This window includes all or some of the following:

- Author
- Journal Reference (or citation for patents, white papers, etc.)
- URLs to information available online
- Article summary of the reference that explains how an alternative can be used to reduce or eliminate the use of a hazardous chemical or process.

Filtering: On the screen of the Search Results page, a filtering option is available in the bottom right hand corner of the wizard. By inputting terms to in the filter and clicking on Filter Further, the database searches through the descriptions, reference titles, and article summaries associated with each chemical or process in the search result list. The chemicals...
or processes that had the filter term appear in its description, its associated reference titles, or the article summaries of its associated reference titles are returned.

**Emailing:** On the *Search Results* page, an *Email Results List* button in the bottom right hand corner of the screen can be clicked to email the URL for that page to an email address. On the *Relevant References* page, an *Email References* button in the bottom right hand corner of the screen can be clicked to email the URL for that page to an email address.

**Printing:** On the *Search Results* or *Relevant References* page, a *Print* button appears on the bottom right hand side of the screen. This can be used to print either the search results on the *Search Results* list or the references on the *Relevant References* page.

**Ordering:** By clicking on a chemical or process returned in the search results list on the *Search Results* page, a *Go to Ordering* button appears in the bottom right hand corner of the screen. Clicking on this button returns links to the chemical ordering process through SciQuest, VWR, or SAPweb.
This tutorial leads you through a search by *Chemical to Replace* for an alternative for dichloromethane, also called methylene chloride.

**SCREEN 1**: Choose ‘Chemical to Replace’ and click ‘Continue’
SCREEN 2: Use the drop-down menu to choose dichloromethane and click ‘Continue’
SCREEN 3: Search results for alternatives for dichloromethane are listed. Processes are listed in blue; chemicals are listed in orange.
SCREEN 3: Click on the search result benzotrifluoride to view its description. Included in the description are pros and cons of the alternative and a link to ‘Get References’ appears. Click on ‘Get References.’
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SCREEN 4: A list of reference titles appears. Click on a reference title to view reference description. Reference description includes authors, citation, URL (if applicable), and an article summary.

(Other options include clicking on ‘Email References’ to email a list of references to yourself, ‘Print’ to print the references, and ‘Go to Ordering’ to directly enter the purchasing system at MIT.)
5. FREQUENTLY ASKED QUESTIONS

How should I start my search?

Please read the description on the right of the first screen. Choose a search method and click Continue. If you are unsure of what to search by, see section 2.

Why can’t I find what I’m looking for?

Make sure to scroll-down in the drop-down menus. Different search categories have different chemicals or processes listed in the drop-down menus. If what you are looking for still does not appear, it is probably not in the database. Please email greenchem@mit.edu so that this information can be inputted in the future.

What if the filter doesn’t work?

Filters search through the text of chemical or process descriptions, reference titles, and article summaries. Exact word matches need to be made in order for a filtered result to appear; try synonyms.

What are the color codes?

In the Search Results list, blue results are processes; orange results are chemicals.

How come I can’t see any descriptions?

Click on an item in the Search Results list to view descriptions.

How come I can’t see any reference details?

Click on the reference titles to get more information.

How come I can’t see the Go to Ordering button?

Click on an item in the Search Results list; the button should appear in the bottom right hand of your screen.

Why are there so many results but so few references?

Many references are associated with more than one chemical and/or process. Therefore, in many cases only one reference is returned for multiple chemicals or processes listed in the Search Results list.

Where do the references come from?

The references typically come from the scientific literature. A few references are from the United States Patent and Trademark Office, white papers, industrial cases studies, MIT case studies, and chemical vendors.
How were these references evaluated?

The references were reviewed for their direct applicability to our goal: reducing the generation of hazardous wastes.

Can a Chemical to Replace also be an Alternative Chemical?

Yes, hazardous chemicals that can be greener alternatives for even more hazardous chemicals are listed in the database. For example, toluene can be used to replace benzene.

What if my chemical has more than one name?

Multiple names of chemical compounds should all appear in the drop-down menus of the database. If not, please email greenchem@mit.edu.
Please contact greenchem@mit.edu with your comments, questions, or suggestions.

This database was created to be launched in June 2006.