The American Cleaning Institute® (ACI) is the industry trade association that represents the formulators of more than 9,000 consumer cleaning products sold in the United States. Recently, ACI set out to identify all ingredients used in members’ products with the goal of identifying the publicly available hazard data for every ingredient and developing an associated exposure assessment and screening level risk assessment. This presentation reviews the methodology used to develop the ingredient inventory for cleaning products, which was completed and published on ACI’s website in August 2013 (as the first stage in this multi-year study project). Over 900 products in the categories of laundry care, dish care, and hard surface cleaners were surveyed and all listed ingredients recorded. Data were captured using a rigorous set of quality assurance criteria, and naming was consolidated to eliminate redundancy and facilitate the search for hazard data. Over 3,000 unique ingredients were identified. Key tasks included consolidation of the ingredient list, resolving differences in ingredient naming, and developing a strategy for identifying ingredient names. This presentation will include demonstration of the end product for the first phase of the effort, which is a web-based database that allows access to ingredient lists and basic identification information. This form will serve as the benchmark for expanding to include hazard, fate, and effects data for the nearly one thousand chemicals represented.

Cleaning Product Ingredient Safety Initiative (CPISI) Overview

ACI has developed the Cleaning Product Ingredient Safety Initiative (CPISI) as one of many efforts to promote the responsible management of cleaning products and their ingredients. This initiative has six major objectives:

- Task 1: To compile and make publicly available a comprehensive inventory of chemicals used among ACI members in the manufacture of consumer cleaning products sold in the U.S.
- Task 2: To identify publicly available human health and environmental hazard data for each cleaning product ingredient.
- Task 3: To identify the human exposure model for each cleaning product that application of each ingredient and estimate the exposure level.
- Task 4: To conduct a screening-level risk assessment and publicly report the margin of exposure for each application resulting from long-term exposure.
- Task 5: To use ACI’s existing Science Website as the vehicle for dissemination of this information through a new electronic learning environment.
- Task 6: To develop the associated public communications program for the project.

Methods

Overview of Results

The goal of Task 1 was to collect all ingredients in all household cleaning products manufactured by participating ACI member companies and develop a consolidated ingredient inventory.

Step 1: Preparing Initial List of Ingredient Names

Data collection focused on ingredients used in product manufacturer websites and databases (Figure 3). Data collection included the following:

- Manufacturer websites and databases to identify products that fit within specific laundry, dish, and hard surface cleaner categories (Table 1).
- Entered ingredient names and relevant data on product type, concentration, supporting identifiers, ingredient function, and use category into the database.
- Used several existing compilations (e.g., IHEA and IFRA) of ingredients as additional data sources. These compilations helped to identify the hazards of each ingredient. The TROY database and added in filling data gaps for ingredients for which related large groups of members had identified the ingredient.

Step 2: Ingredient Consolidation

In the ingredient consolidation step, keys to ingredient naming, grouping, and use are combined to create duplicate listed, equivalent, or similar ingredients to produce an inventory suitable for Task 2 (Figure 3). This was accomplished by:

- Consolidating repeated ingredient names by assigning one or more common names from trade literature and chemical nomenclature.
- Replacing ingredients identified by generic chemical name with more specific name.
- Reviewing all ingredients individually to assign CAS Registry Numbers.

Step 3: Quality Assurance and Quality Check

- Re-entered the database to ensure data integrity.
- Conducted multiple checks to verify accuracy.
- Conducted queries to search for inconsistencies.
- Compared with companies and trade associations to clarify listings.

Presence in Personal Care Products

The finalized Task 1 ingredient inventory was cross-referenced with the U.S. Food and Drug Administration’s (FDA) Voluntary Cosmetic Registration Program (VCRP) to determine how many ingredients on the list are also used in personal care products sold to U.S. consumers. The VCRP data were compared to the International Fragrance Association (IFRA) Transparency List of more than 2,000 fragrance ingredients used in consumer products worldwide.

Lessons Learned and Next Steps

The ingredient inventory represented several data collection and consolidation challenges. These included resolving the differences in ingredient naming as well as developing a strategy for initial grouping of ingredients into chemical classes. Careful consideration was given to grouping established by previous studies and product labels which listed a general chemical class as opposed to a specific ingredient name.

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Table 1. Results for Product Categories, Uses, and Forms

<table>
<thead>
<tr>
<th>Product Category</th>
<th>Uses</th>
<th>Forms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hand wash</td>
<td>Liquid, powder</td>
<td>Liquid, powder, sheet, tablet/packet</td>
</tr>
<tr>
<td>Ironing aid/conditioner</td>
<td>Liquid, powder</td>
<td>Liquid, powder, tablet/packet</td>
</tr>
<tr>
<td>Hand dishwashing liquid</td>
<td>Liquid, powder</td>
<td>Liquid, powder, tablet/packet</td>
</tr>
<tr>
<td>Pot/pan cleaner</td>
<td>Liquid, powder</td>
<td>Liquid, powder, tablet/packet</td>
</tr>
<tr>
<td>Laundry detergent</td>
<td>Liquid, powder</td>
<td>Liquid, powder, tablet/packet</td>
</tr>
<tr>
<td>Bleach</td>
<td>Liquid, powder</td>
<td>Liquid, powder, tablet/packet</td>
</tr>
<tr>
<td>Fabric conditioner</td>
<td>Liquid, powder</td>
<td>Liquid, powder, tablet/packet</td>
</tr>
<tr>
<td>Laundry detergent booster</td>
<td>Liquid, powder</td>
<td>Liquid, powder, tablet/packet</td>
</tr>
<tr>
<td>All purpose cleaner</td>
<td>Liquid, powder</td>
<td>Liquid, powder, tablet/packet</td>
</tr>
</tbody>
</table>

Figure 1. Data compilation procedure.

Figure 3. CPISI ingredient inventory published on the ACI Science Website August 2012.