CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2000
DateRun:	05/05/2000
Experimenters:	Jason Marshall
ClientType:	Consultant
ProjectNumber:	Project #1
Substrates:	Liquid
PartType:	Part
Contaminants:	
Cleaning Methods:	
Analytical Methods:	Surfactant Titration
Purpose:	To determine relative concentration of Hotel cleaning solutions.

Experimental Procedure:

Samples of each cleaning solution were collected from the client's staff by SCL. The products collected were from the supply used during actual cleaning. The client samples were to be compared to the products SCL received from the vendor (ready to use concentration). Titrations were tested for nonionic surfactant content using Bama Chem Nonionic Surfactant Kit.

The general procedure is as follows:
1. ADD APPROXIMATELY 25 ML OF WATER TO MIXING VIAL
2. ADD 8 DROPS OF INDICATOR SOLUTION TO VIAL. COLOR SHOULD BE GREEN.
3. ADD 15 DROPS OF 20% SULFURIC ACID TO VIAL (20 DROPS IF STRONGLY ALKALINE DETERGENTS ARE TESTED) AND SWIRL. COLOR SHOULD NOW BE PURPLE. (CAUTION: HANDLE THIS SOLUTION WITH CARE. IT IS CORROSIVE AND MAY CAUSE BURNS.)
4. ADD 0.5ML OF NONIONIC DETERGENT SOLUTION TO VIAL AND SWIRL, COLOR SHOULD NOW TURN BACK TO GREEN OR YELLOW-GREEN.
5. ADD TITRATING SOLUTION DROPWISE WHILE COUNTING UNTIL THE COLOR CHANGES TO A WINE-RED OR PURPLE. (ABOUT HALFWAY TO THE ENDPOINT THE COLOR WILL BE TAN OR LIGHT BROWN). NOTE THE NUMBER OF DROPS NEEDED AND MULTIPLY BY 0.5 TO GET % BY VOLUME OF NONIONIC DETERGENT. EACH DROP IS EQUIVALENT TO 0.0028 GRAMS OF SURFACTANT.

A similar procedure was used for the Anionic surfactant testing kit:
1. Add 50 ml of water to vial.
2. ADD I ML OF DETERGENT SOLUTION WITH A CALIBRATED DROPPER OR SYRINGE. TO TEST VERY STRONG DETERGENT SOLUTIONS, USE 0.10 ML AND MULTIPLY FACTOR USED IN STEP 6 BY 10. VERY WEAK SOLUTIONS MAY REQUIRE THE USE OF A 10 ML SAMPLE AND DIVIDING THE STEP 6 FACTOR BY 10.
3. ADD 3 TO 6 DROPS OF REAGENT "A" TO THE VIAL.
4. IF THE COLOR OF THE SOLUTION IN THE VIAL IS PINK OR PURPLE TO BEGIN WITH, ADD DROPS OF SOLUTION "D" UNTIL THE COLOR IS BLUE, THEN ADD I ML OF SOLUTION "B" TO GET "PURPLE. IF THE COLOR IS BLUE TO BEGIN WITH, ADD I ML OF SOLUTION "B" TO GET PURPLE. (IF COLOR REMAINS "BLUE" SEE CAUTION BELOW.)
5. ADD DROPS OF SOLUTION "C" UNTIL COLOR IS PINK AND NOTE THE NUMBER OF DROPS NEEDED (ONE ADDITIONAL DROP SHOULD NOT CHANGE THE COLOR.)

The chemistries used were:
COMPANY PRODUCT
Ecolab Oasis 499 Tub & Tile Cleaner
Ecolab Oasis 266 All Purpose Cleaner
Ecolab Oasis 255 Glass Cleaner

SUBSTRATE MATERIAL: Liquid
CONTAMINANTS: None

Results:

The base line (lab sample) of the Tub & Tile cleaner had an approximate concentration of 1.25% by volume. The client sample from the Lenox was nearly six times the lab sample, 7.21%. This product was not used at the Copley. Results were similar for the All Purpose Cleaner. The Lenox had a concentration about 13 times that of the lab sample. The Copley concentration was slightly less than the lab sample. Table 1 lists the results from the Nonionic testing.

Table 1. Nonionic Testing Results

	SCL Sample	Lenox Sample	Copley Sample
Mfr	Ecolab	Ecolab	Ecolab
Product	Tub & Tile Cleaner	Tub & Tile Cleaner	Tub & Tile Cleaner
Conc. %	1.25	7.21	Not Tested
Volume	0.5	0.2	Not Used at Copley

CLEANING LABORATORY EVALUATION SUMMARY

Wt of Surf in Sample	0.0364	0.084	
% Surf.	6.5	37.5	
Total Surf %	520	520	
	SCL Sample	Lenox Sample	Copley Sample
Mfr	Ecolab	Ecolab	Ecolab
Product	All Purpose	All Purpose	All Purpose
Conc. %	1.25	16.25	1.09
Volume	1	0.5	1
Wt of Surf	0.0112 in Sample Wt of Surf	0.0728	0.0098
% Surf.	1	13	0.875
Total Surf %	80	80	80

The third cleaning solution evaluated, Glass Cleaner, yielded concentrations nearly identical for all three products. The two client supplied solutions were slightly lower than the lab sample. Table 2 lists the results for each product.

Table 2. Anionic Testing

	SCL Sample	Lenox Sample	Copley Sample
Cleaner Mfr	Ecolab	Ecolab	Ecolab
Product Name	Glass Cleaner	Glass Cleaner	Glass Cleaner
Concetration Used	1.25%	<1.25 %	<1.25 %
Drops Required	5	4	4
Sample Size	1.0 ml	1.0 mL	1.0 mL

Summary:

Conclusion: The products being used at the Lenox appear to be used at too high of a concentration resulting in potential worker over exposure. The use of high concentrations also leads to increased operating costs.