UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

SUBJECT: Review of Sterilex Corporation Product Registration For n-alkyl(C_{14}95%,C_{12}3%,C_{16}2%) Dimethylbenzylammonium Chloride.

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ID NO.: 063761-U Ultra-Kleen Powder for Dental Unit Water Lines

DP BARCODE: D261577

SUBMISSION: S572183

CASE NO.: 065186

PC CODE: 069184

CHEMICAL NAME: n-Alkyl(C_{14}95%,C_{12}3%,C_{16}2%) dimethylbenzylammonium chloride

Introduction:

Scientific & Regulatory Consultants, Inc. on behalf of Sterilex Corporation has submitted an application for registration of the product, ULTRA-KLEEN POWDER FOR DENTAL UNIT WATER LINES. The product is to be used to clean and control bacterial contamination in dental unit water lines (DUWLs). The product label does not make any claims for biofilm control. RASSB has been requested to review the residue study that is submitted with this registration action. This is an FQPA action.

Background:

This product is said to be substantially similar to the product, Ultra-Kleen CW 502, EPA Reg. No. 63761-2. That product contains the same quaternary ammonium salt and with the same 10% active ingredient as this product under review. That product is registered for use in food processing water systems, pulp and paper mill systems, air washer water systems, commercial and industrial water cooling tower systems, evaporative condenser water systems, sewage systems, heat exchanger water systems and in industrial processing water. That product is registered for use against the pest species slime-forming bacteria, slime-forming fungi (paper mills/water systems) and algae. That product is a microbiocide/microbiostat and algaecide.

This quaternary ammonium compound is on FIFRA 88 list: A.

This dental line product also contains another ingredient that is claimed as an inert ingredient but would have probably been determined to be active if a biofilm claim were to have been made on the label (see Confidential Appendix).

The remaining inert ingredients are either GRAS under 40 CFR 180.2 or are exempt as inert ingredients under 40 CFR 180.1001(c) and are on EPA Inert Lists 3 or 4B. These inert ingredients also have clearances under 21 CFR for various drug and cosmetic uses.

Conclusions:

1. OPPTS GLN 860.1200. Proposed Use.
The proposed use is a dental line use. The product will be introduced into dental lines after the dental office closes for the business day; it will remain in the dental lines (and equipment) overnight; and then it will be rinsed from the line with water before equipment use when the dental office reopens. The worst case exposure would result if the dental office staff fail to rinse the dental line when the office reopens for business. Under those conditions, a dental patient would receive a mouthful of the cleaning solution when the dental line is used. Because of the taste, most patients would not likely ingest the wash solution. The patient would, however, be subject to exposure, and absorption of the chemical wash solution through the mouth lining.

2. OPPTS GLN 860.1300. Nature of the Residue.
The chemical residue that a patient would be exposed to from the proposed use will likely be the parent compound itself. This conclusion is based on information available that indicates closely

related quaternary ammonium compounds are stable to hydrolysis.

3. OPPTS GLN 860.1340. Analytical Residue Method.
a) A spectrophotometric method was used to determine the residue levels of the quaternary ammonium active ingredient in the dental equipment water line. No details of the method were given and no conclusions can be drawn on the adequacy of the method to determine residues of the quaternary compound.
b) A "test strip" method was used to determine the residue levels of the inert ingredient in the formulation (that would have likely been active if a biofilm claim had been made on the label). No details of the method were given and no conclusions can be drawn on the adequacy of the method to determine this ingredient (see Confidential Appendix).

4. OPPTS GLN 860.1500. Residue Data.
a) On a calculated basis, the dental line wash solution contains approximately 5000 ppm of the quaternary ammonium active ingredient compound. Ths is the number that the AD toxicologists should use to calculate worst case exposure.
b) The registrant submits data that shows that after a one minute flush time with water, the concentration of the quaternary ammonium active ingredient compound in the flush solution from the dental line is 5.5 ppm. However, the registrant has not submitted any validation data with the analytical method and has not submitted any raw data to support the conclusion on residue levels in the flush solution. RASSB cannot draw a conclusion on the validity of these data. Based on the same methodology, the registrant states that the concentration of the quaternary ammonium compound in the flush solution after a two minute flush is 2.2 ppm.
c) The registrant also submitted information on the residue levels of the above noted inert ingredient in the dental line cleaning solution and in the flush solution. This can be found in the Confidential Appendix.

5. Provided that RASSB toxicologists do not need any other information than the calculated residue levels in Conclusion 4 above, then no additional residue chemistry are needed to support the proposed dental line use. This is not a food use and no tolerance or tolerance exemption is needed in conjunction with this registration. No validated analytical residue method will be needed.

Recommendations:

1. Provided that RASSB toxicologists do not need any more residue data than the calculated values reported above, the analytical method(s) do not need to be validated. If RASSB toxicologists need verifiable residue data at the 1 or 2 minute flush intervals, then detailed written and validated analytical method(s) will need to be submitted. Additional residue data for the active ingredient would also need to be generated at the 1 and 2 minute flush intervals using an adequately validated method.

Detailed Considerations

OPPTS GLN 860.1100 Chemical Identity

The name of the product is Ultra-Kleen Powder for Dental Unit Water Lines. It is to be formulated specifically to clean and control bacterial contamination in dental unit water lines. The chemical has other products registered for use as a microbicide/microbistat and as an algaecide.

The active ingredient is n-Alkyl(C_{14}95%,C_{12}3%,C_{16}2%) dimethylbenzylammonium chloride. The CAS No. is 68424-85-1.

The percent active ingredient in the formulation is 10%. The product is sold in packets containing 12.5 grams of the product.

OPPTS GLN 860.1200 Proposed Use

The product, Ultra-Kleen Powder for Dental Unit Water Unit Lines, is to be used as an initial start-up treatment and as a routine treatment. For the initial start-up treatment, the dental unit water lines (DUWLs) are to be treated for three consecutive nights starting on a Monday. For routine treatment after start-up treatment, treatment of DUWLs is to be one night/week (label recommends Monday-Thursday).

At the end of the work day, 8 ounces of hot water are to be added to the empty external dental unit water container. One packet of the Ultra-Kleen is to be added to the hot water and dissolved. The Ultra-Kleen solution is to be run through the system until the pink solution appears at the A/W Syringe and Handpiece. The Ultra-Kleen solution is allowed to remain in the unit overnight. At the beginning of the next workday, the remaining Ultra-Kleen is discarded. The external water unit is rinsed with warm water. The container is then filled with warm water and each dental line (A/W Syringe, Handpiece) is flushed for one minute. Because each packet of Ultra-Kleen contains 12.5 gms., the treatment solution contains 0.5% active ingredient (5000 ppm).

OPPTS GLN 860.1340. Residue Analytical Method and OPPTS GLN 860.1500. Residue Data

MRID NO. 449806-01. Volume2. Ultra-Kleen Powder for Dental Unit Water Lines. EPA Reg.No. 63761-x.

No written and validated analytical method is submitted for the quaternary ammonium chloride active ingredient. There is a half-page discussion of the residue method and of the residue study. The type of residue method used is mentioned and 4 sentences are included to describe how the residue study was conducted.

Method for the quaternary ammonium chloride compound.
The effluent was collected from the DUWL and tested for quaternary ammonium concentration

using a Hach DR/2000 spectrophotometer via Hach Method No 8337. A copy of the method was not submitted. Dilutions of the effluent samples were made as necessary. A calibration curve was generated showing the relationship between the quaternary concentration of standard solutions and quaternary concentration (as cetyltrimethyl ammonium bromide) determined by the Hach method. No conclusion can be made concerning the validity of the residue data generated by this method because the detailed written method was not submitted for review and no validation data were submitted for the method.

Residue Data

Solutions of the product, Ultra-Kleen for Dental Unit Water Lines, were prepared by dissolving 5.0 grams of powder in 100 ml. of 400ppm synthetic hard water. On Table 2, the registrant states that this is a 5% dilution. However, because the formulation is 10% active ingredient, this dilution produces a 0.5% active solution. The solution was introduced into a dental unit at the University of Maryland Dental School and allowed to stand overnight. The following morning, an initial 25 ml. sample was collected from each dental unit. The dental unit was then allowed to run for one minute after which a second 25 ml. sample was collected. Analyses were conducted on the effluent samples. The flow rate on the units was found to be about 250 ml. per minute (mean value).

The residue of quaternary ammonium chloride chemical in the flush water after flushing for one minute was 5.5 ppm. After a two minute flush with water, the residue of quaternary ammonium chloride in the flush water was reported as 2.2 ppm.

Worst case exposure:

The worst case exposure for patients resulting from this use would be the case in which the dental office staff failed to flush the treatment solution from the dental unit water lines with water. If this were the case, then the first patient on the day, after the units were cleaned and the office reopened, would receive an initial dose of the cleaning solution in his/her mouth. It is unlikely that the patient would swallow the cleaning solution due to the taste. Therefore, the first patient could receive a mouthful of the cleaning solution containing 5000 ppm of the quaternary ammonium chloride. According to the registrant, a typical mouthful of rinse solution is 30 ml. of water. If the patient takes into his/her mouth 30 ml. of the 0.5% quaternary ammonium chloride solution, this would be 0.15 gram of the quaternary compound. It is possible the patient could swallow this solution, but this is probably unlikely. The tissues of the patient's mouth would, however, be exposed to the cleaning solution.

5000 mg.of quat./kg(ppm) x 0.03 kg.(30 ml) = 150 mg. of quaternary ammonium chloride

Typical exposure:

The typical exposure of the patient to the quaternary ammonium chloride wash solution is for the patient to be exposed to the quaternary compound solution after the DUWLs have been flushed with water after the unit cleaning treatment. Assuming that the registrant's residue data are valid (and noting that the registrant did not provide enough information for us to draw this conclusion-

see above), then the patient could either ingest or have his/her mouth exposed to DUWL water containing 5.5 ppm of quaternary ammonium chloride. This would be 0.165 mg of the quaternary compound.
5.5 mg of quat./kg(ppm) x 0.03 kg.(30 ml) = 0.165 mg. of quaternary ammonium compound

As a worst case, the RASSB toxicologist should assume that the dental lines were not flushed with water after cleaning and that the patient is exposed to the 5000 ppm cleaning solution.

Other Considerations

A discussion of the inert ingredients, including an inert which could be considered an active ingredient if the efficacy claims on the label were to be expanded, is included in a Confidential Appendix to this review.

Page 7 is not included in this copy.

Pages _____ through _____ are not included in this copy.

The material not included contains the following type of information:

✓ Identity of product inert ingredients.

_____ Identity of product impurities.

_____ Description of the product manufacturing process.

_____ Description of quality control procedures.

_____ Identity of the source of product ingredients.

_____ Sales or other commercial/financial information.

_____ A draft product label.

_____ The product confidential statement of formula.

_____ Information about a pending registration action.

_____ FIFRA registration data.

_____ The document is a duplicate of page(s) _____.

_____ The document is not responsive to the request.

The information not included is generally considered confidential by product registrants. If you have any questions, please contact the individual who prepared the response to your request.