

RYNEX HOLDINGS, LTD.

December 2, 1997

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SUBJECT: Rynex Biodegradable Dry Cleaning Fluid Toxicity Assessment

NOTE: Confidential and Proprietary Business Information

To whom it may concern:

Please be advised that this submission contains confidential business information for use by the USEPA Cleaner Technology Assessment Program.

This submission is made as follow up to my conversation on Wednesday, December 3, 1997 1997 with Dr. Fred Metz.

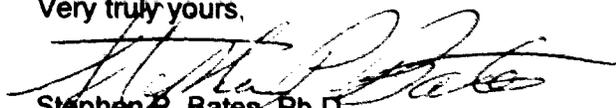
Rynex Corporation has applied for a US Patent for its Biodegradable Dry Cleaning Fluid. In the interim, we request that you and your department maintain all formulation information as confidential and proprietary as per the provisions of USEPA regulations.

We respectfully request that you review the enclosed information. We desire to be included in the Cleaner Technology Substitute Assessment program for the dry cleaning industry.

I have enclosed a sanitized copy of the data sheet so that you may respond to freedom of information requests.

Thank you for the opportunity to share this information with you. We look forward to your favorable determination. If you have any questions or if I can be of further assistance, please contact me directly at (516) 364-8993 or page me at (800) 646-1162.

Very truly yours,


Stephen P. Bates, Ph.D.
Director of Chemical Engineering

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8498 0000235

CC: William Hayday

RYNEX HOLDINGS, LTD.

Sanitized Data Sheet

Formulation

Rynex is an azeotropic mixture of a Propylene glycol ether with water and detergent.

Toxicology and Ecotoxicity

Based on laboratory animal studies, propylene glycol ethers do not cause the type of toxicological effects that are associated with exposure to ethylene glycol ethers.

Oral administration, Sprague Dawley rat LD₅₀ = 3771 mg/kg
Inhalation Sprague Dawley rat LC₅₀ = >2680 mg/l
Dermal administration, New Zealand White Rabbit LD₅₀ = > 2000mg/kg
Skin irritation New Zealand White Rabbit = not classified
Eye irritation New Zealand White Rabbit = not classified
Skin sensitization, Hartley Dunkin guinea pig = not classified
Subacute toxicity (28 day study), Fisher- 344 rat = not classified
Mutagenicity (bacteriological test) Salmonella typhimurium strain = not mutagenic
In vitro (non-bacteriological test) Cultured peripheral human lymphocytes = not mutagenic
Developmental, Charles River CDF rat = no developmental toxicity upto 990 ppm by inhalation
Developmental, New Zealand White rabbit, NOEL = 984 ppm
Acute toxicity for fish, Rainbow trout - 96 hour LC 50 = > 1000 mg/l; NOEC = 320 mg/l
Bluegill sunfish - NOEC > 1000 mg/l
Acute toxicity for Daphnia Magna - 48 hour LC 50 => 1000 mg/l; NOEC = 56 mg/l

Biodegradation

Propylene glycol ethers are biodegradable. The biodegradation of glycol ethers or any chemical may be determined by various procedures including measuring consumption of dissolved oxygen by microorganisms using organic matter (including the chemical of concern) as fuel. Such a test is called a Biological Oxygen demand (BOD) test. Studies performed on Rynex showed that the material is inherently biodegradable. When the BOD study was carried out to 35 days dissolved oxygen consumed by the inoculum was 60 %. Some regard a chemical that allows to consume 60 % of the oxygen present within a 28 day period as "readily biodegradable". Although the material requires slightly longer to degrade it is inherently biodegradable.