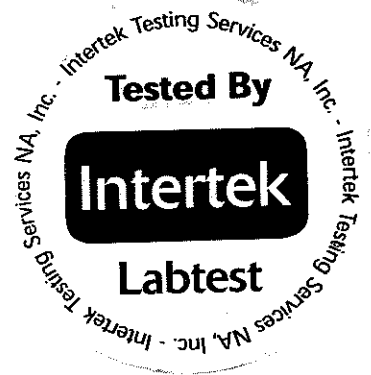


PRODUCT AGE GRADE EVALUATION

Report # 25943

**Thames & Kosmos
207 High Point Avenue
Portsmouth, RI 02871**

December 6, 2004



Requested by: Ted McGuire
Authorization Received: October 4, 2004
Sample Name: Chem C2000
Model/Style #: 644512
Sample Received: October 1, 2004
Number of Samples: 1
Condition Received: Good
Testing Completed: December 2, 2004

SUMMARY:

RESULTS

Age Grading Determination:

See page 2 for detailed findings.

Toxicological Risk Assessment:

See page 3 – 4 for detailed findings.

Reviewed by:

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Thames & Kosmos**Product Age Grade Evaluation****Sample ID: Chem C2000 # 644512****Labeled Age Grading: Not Labeled****Recommended Age Grading: 8 +**

As per the CPSC Age Grading Guideline, children begin to develop an interest in Chemistry Sets during ages 6 through 8 years of age. The following is taken from the current version of these guidelines (Page 261-262).

Learning toys for elementary-aged children are very much the same as those for preschoolers. The only difference is the level of complexity. Elementary aged children, particularly upper elementary, find realistic-looking learning toys more appealing than those that look like children's toys. They prefer to interact with real-world objects rather than plastic replicas. These children are ready for skill-specific toys, rather than those that focus on broad concepts used by the preschoolers.

Literacy is an emerging skill during these years, so toys that reinforce reading are appropriate. At age 6, children are still during establishing the foundation of reading; by age 8 and 9, most are reading fluently and reading for content (see Educational & Academic Play: Books). Growing math skills include simple addition and subtraction in the early grades, and multiplication, division, and fractions in the later grades.

Children in this age group can use more sophisticated science and chemistry sets, telescopes, and binoculars. They are interested in their own anatomy and elements in the world, so scientific exploration sets that allow dissecting and slide examination are highly attractive.

Adult supervision is warranted depending on the child, the type of equipment and the particular use of the equipment (such as sharp edges / blades or chemicals in science sets). They may also find toys that focus on astronomy and the solar system interesting.

Thames & Kosmos**Toxicological Risk Assessment****Sample ID: Chem C2000 # 644512****Procedure:**

This product was evaluated for potential acute and chronic oral / dermal toxicity and skin / eye irritation.

Background:

A single chemistry set product consists of two trays of chemical substances. The first tray contains 7.8 grams of hexamethylene-triamine, 25 grams of sodium hydrogen sulfate, 4 grams of potassium hexacyanoferrate (II), 8.5 grams of calcium hydroxide, 12 grams of sodium carbonate, 5 grams of ammonium iron (III) sulfate, 10 grams of ammonium chloride, 3.5 grams of copper (II) sulfate, 10 milliliters of phenolphthalein solution (1% phenolphthalein in ethanol) and two strips of magnesium. The second tray contains 27 grams of sodium bicarbonate, 6 grams of tartaric acid, 3 grams of a luminal solution, 6 grams of potassium hexacyanoferrate (III), 20 grams of calcium sulfate, 3.5 grams of copper (III) sulfate, 13 grams of iron filings and 7 grams of potassium permanganate, preparation. It is assumed that these ingredients contain no contaminants that would be toxic or irritating to a consumer who may contact them.

Exposure Assessment:

An exposure assessment scenario for a given chemical of concern to a potential human receptor consists of creating a series of logical pathways and events whereby that chemical could reasonably be expected to come into contact with that receptor. It is reasonable to assume that each of the chemicals in a single chemistry set product may make multiple contacts with the skin, occasionally be ingested or contact the eyes as single exposure events.

Toxicological Assessment:

Information obtained from the National Library of Medicine's toxicological databases provided no evidence that dermal exposures to the small amounts of the chemicals in a single chemistry set5 would not be expected to cause acute or chronic toxic effects or skin irritation in humans who may be exposed to them as described above. However, ingestion of several of these chemicals (especially potassium hexacyanoferrate, potassium permanganate) would be expected to cause nausea, vomiting and diarrhea. In addition, two chemicals in this set (calcium hydroxide, ammonium chloride) have been reported to be severely irritating to the eyes.

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Risk Assessment:

The potential risk from a chemical substance to an individual is a function of both the exposure to an toxicity / irritation potential of that particular chemical. Information provided to date provides no indication that the chemicals in this chemistry set would be expected to be toxic via dermal exposure or cause significant irritation to the skin. However, ingestion of most of them would be expected to cause nausea, vomiting and diarrhea (especially in children) and exposures to some of them would be expected to cause eye irritation.

Conclusion:

Based on a review of all the available information provided to date, it is our opinion that exposure to this "Chem C2000" product would not be expected to cause significant acute or chronic dermal toxicity or skin irritation to consumers who may be exposed to them as described above when this product is used as intended or under circumstances involving foreseeable misuse.

However, ingestion of most of the chemicals in this product would be expected to cause nausea, vomiting and diarrhea (especially in children) and some of them would be expected to cause eye irritation on contact. It is recommended that children using this product be adequately supervised.

