Risk Assessment of Metals in Consumer Products Intended for Children

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ABSTRACT

Recently concerns have been raised about toxic chemicals, especially metals, found in consumer products (CPs). An example is lead, cadmium, antimony, and chromium found in children’s jewelry. Risk assessment protocols, and toxicity and toxicokinetic (TK) data developed for evaluating chronic exposure are often inadequate for assessing short-term exposure to CPs; and, risk assessments for some CPs remain uncertain. Public awareness is great, making the need for risk assessments which are realistic at feasible exposure levels even more critical. Current legislation aimed at addressing concerns for metals such as lead is not sufficient to reach an all-meaningful concern.

CONSUMER PRODUCTS IN THE NEWS

Limited List of the Oral Toxicity Criteria

- Health-shaped charm bracelet given as a free gift with shoe purchase
- Children’s Silver Earrings: Lead Content of Metal Charm was 98.1%
- December 2009 – “Antimony and Chromium Above Legal Limits in Some of Season’s Most Popular Toys”

INTRODUCTION

- Consumer product (CP) safety is currently the focus of all stakeholders – particularly children’s products.
- Major uncertainties in CP risk assessment exist. Public awareness is great, making the need for risk assessments which are realistic at feasible exposure levels even more critical.
- Current legislation aimed at addressing concerns for metals such as lead is not sufficient to reach an all-meaningful concern.
- This poster discussion considers for CP risk assessment presents an example risk evaluation, and identifies key uncertainties and information needed for assessing CP risk.

BACKGROUND

- Two small, component CPs (CP #1 and CP #2) designed for children
- Adulthood exposure scenario
- US CPSC testing methodology generally followed. Individual CP components tested for lead, cadmium and antimony.
- Similarity in saliva – containing receiving medium
- Saliva: Cusp in distribution – mincing receiving medium

METHODS

- Four duplicates of each of CP evaluated
- Individual CP components tested for lead, cadmium and antimony.

CASE STUDIES – POTENTIAL HAZARD FROM LEAD AND CADMIUM IN TWO CPs

RESULTS AND COMPARISON TO REGULATORY LIMITS AND TOXICITY CRITERIA

- Total Metals
  - Total [Pb] ranged from non-detect – 0.25 µg
  - Total [Cd] ranged from non-detect – 0.75 µg

- Toxicity
  - Lead
    - Oral LD₅₀: 5.0 mg/kg
    - Lim: 5,000 µg/kg-d
  - Cadmium
    - Oral LD₅₀: 0.75 mg/kg
    - Lim: 50 µg/kg-d

CONSUMER PRODUCTS IN THE NEWS

- December 2009 – “Antimony and Chromium Above Legal Limits in Some of Season’s Most Popular Toys”

REFERENCES


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