



Toxicological Risks of Selected Flame-Retardant Chemicals

NATIONAL RESEARCH COUNCIL

Toxicological Risks Of Selected Flame Retardant Chemicals

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Toxicological Risks Of Selected Flame Retardant Chemicals:

Toxicological Risks of Selected Flame-Retardant Chemicals National Research Council, Commission on Life Sciences, Board on Environmental Studies and Toxicology, Committee on Toxicology, Subcommittee on Flame-Retardant Chemicals, 2000-08-06 Ignition of upholstered furniture by small open flames from matches cigarette lighters and candles is one of the leading causes of residential fire deaths in the United States These fires accounted for about 16% of civilian fire deaths in 1996 On average each year since 1990 about 90 deaths primarily of children 440 injuries and property losses amounting to 50 million dollars have resulted from fires caused by the ignition of upholstered furniture by small open flames Certain commercial seating products such as aircraft and bus seats are subject to flammability standards and sometimes incorporate FR treated upholstery cover materials but there is no federal government requirement for residential upholstered furniture and it is generally not treated with FR chemicals It is estimated that less than 0.2% of all U.S. residential upholstery fabric is treated with flame retardant FR chemicals The Consumer Product Safety Act of 1972 created the U.S. Consumer Product Safety Commission CPSC as an independent federal regulatory agency whose mission is to protect the public from unreasonable risks of injury and death associated with consumer products CPSC also administers the Flammable Fabrics Act under which it regulates flammability hazards and the Federal Hazardous Substances Act FHSA which regulates hazardous substances including chemicals In 1993 the National Association of State Fire Marshals petitioned CPSC to issue a performance based flammability standard for upholstered furniture to reduce the risk of residential fires The Commission granted that portion of the petition relating to small open flame ignition risks In response to concerns regarding the safety of FR chemicals Congress in the fiscal year 1999 appropriations report for CPSC requested that the National Research Council conduct an independent study of the health risks to consumers posed by exposure to FR chemicals that are likely to be used in residential upholstered furniture to meet a CPSC standard The National Research Council assigned the project to the Committee on Toxicology COT of the Commission on Life Sciences Board on Environmental Studies and Toxicology COT convened the Subcommittee on Flame Retardant Chemicals which prepared this report Subcommittee members were chosen for their recognized expertise in toxicology pharmacology epidemiology chemistry exposure assessment risk assessment and biostatistics Toxicological Risks of Selected Flame Retardant Chemicals is organized into 18 chapters and two appendices Chapter 2 describes the risk assessment process used by the subcommittee in determining the risk associated with potential exposure to the various FR chemicals Chapter 3 describes the method the subcommittee used to measure and estimate the intensity frequency extent and duration of human exposure to FR chemicals Chapters 4-19 provide the subcommittee's review and assessment of health risks posed by exposure to each of the 16 FR chemicals Data gaps and research needs are provided at the end of these chapters Toxicological Risks of Selected Flame-Retardant Chemicals National Research Council, Commission on Life Sciences, Board on Environmental Studies and

Toxicology, Committee on Toxicology, Subcommittee on Flame-Retardant Chemicals, 2000-07-06 Ignition of upholstered furniture by small open flames from matches cigarette lighters and candles is one of the leading causes of residential fire deaths in the United States These fires accounted for about 16% of civilian fire deaths in 1996 On average each year since 1990 about 90 deaths primarily of children 440 injuries and property losses amounting to 50 million dollars have resulted from fires caused by the ignition of upholstered furniture by small open flames Certain commercial seating products such as aircraft and bus seats are subject to flammability standards and sometimes incorporate FR treated upholstery cover materials but there is no federal government requirement for residential upholstered furniture and it is generally not treated with FR chemicals It is estimated that less than 0.2% of all U.S. residential upholstery fabric is treated with flame retardant FR chemicals The Consumer Product Safety Act of 1972 created the U.S. Consumer Product Safety Commission CPSC as an independent federal regulatory agency whose mission is to protect the public from unreasonable risks of injury and death associated with consumer products CPSC also administers the Flammable Fabrics Act under which it regulates flammability hazards and the Federal Hazardous Substances Act FHSA which regulates hazardous substances including chemicals In 1993 the National Association of State Fire Marshals petitioned CPSC to issue a performance based flammability standard for upholstered furniture to reduce the risk of residential fires The Commission granted that portion of the petition relating to small open flame ignition risks In response to concerns regarding the safety of FR chemicals Congress in the fiscal year 1999 appropriations report for CPSC requested that the National Research Council conduct an independent study of the health risks to consumers posed by exposure to FR chemicals that are likely to be used in residential upholstered furniture to meet a CPSC standard The National Research Council assigned the project to the Committee on Toxicology COT of the Commission on Life Sciences Board on Environmental Studies and Toxicology COT convened the Subcommittee on Flame Retardant Chemicals which prepared this report Subcommittee members were chosen for their recognized expertise in toxicology pharmacology epidemiology chemistry exposure assessment risk assessment and biostatistics Toxicological Risks of Selected Flame Retardant Chemicals is organized into 18 chapters and two appendices Chapter 2 describes the risk assessment process used by the subcommittee in determining the risk associated with potential exposure to the various FR chemicals Chapter 3 describes the method the subcommittee used to measure and estimate the intensity frequency extent and duration of human exposure to FR chemicals Chapters 4-19 provide the subcommittee's review and assessment of health risks posed by exposure to each of the 16 FR chemicals Data gaps and research needs are provided at the end of these chapters

Environmental Health Perspectives, 2004 **Information Resources in Toxicology** P.J. Bert Hakkinen, Asish Mohapatra, Steven G. G. Gilbert, 2009-08-19 This latest version of Information Resources in Toxicology IRT continues a tradition established in 1982 with the publication of the first edition in presenting an extensive itemization review and commentary on the information infrastructure of the field This book is a unique wide ranging international annotated

bibliography and compendium of major resources in toxicology and allied fields such as environmental and occupational health chemical safety and risk assessment Thoroughly updated the current edition analyzes technological changes and is rife with online tools and links to Web sites IRT IV is highly structured providing easy access to its information Among the hot topics covered are Disaster Preparedness and Management Nanotechnology Omics the Precautionary Principle Risk Assessment and Biological Chemical and Radioactive Terrorism and Warfare are among the designated International in scope with contributions from over 30 countries Numerous key references and relevant Web links Concise narratives about toxicologic sub disciplines Valuable appendices such as the IUPAC Glossary of Terms in Toxicology Authored by experts in their respective sub disciplines within toxicology

Advances in Fire Retardant Materials A. Richard Horrocks, D. Price, 2008-09-19 This important book provides a comprehensive account of the advances that have occurred in fire science in relation to a broad range of materials The manufacture of fire retardant materials is an active area of research the understanding of which can improve safety as well as the marketability of a product The first part of the book reviews the advances that have occurred in improving the fire retardancy of specific materials ranging from developments in phosphorus and halogen free flame retardants to the use of nanocomposites as novel flame retardant systems Key environmental issues are also addressed The second group of chapters examines fire testing issues and regulations A final group of chapters addresses the application of fire retardant materials in such areas as composites automotive materials military fabrics and aviation materials With its distinguished editors and array of international contributors this book is an essential reference for producers manufacturers retailers and all those wishing to improve fire retardancy in materials It is also suitable for researchers in industry or academia Reviews advances in improving the retardancy of materials Addresses key environmental issues Examines fire testing issues and regulations and the challenges involved

Sustainable Textiles Richard Blackburn, 2009-10-19 Environmental issues are playing an increasingly important role in the textile industry both from the point of view of government regulation and consumer expectations Sustainable textiles reviews ways of achieving more sustainable materials and technologies as well as improving recycling in the industry The first part of the book discusses ways of improving sustainability at various points in the supply chain Chapters discuss how sustainability can be integrated into textile design ensuring more sustainable production of both natural and synthetic fibres improving sustainability in processes such as dyeing as well as more environmentally friendly technologies including enzyme and plasma technologies The second part of the book reviews consumer perceptions of recycled textiles eco labelling organic textiles and the use of recycled materials in textile products With a distinguished editor and an impressive range of international contributors Sustainable textiles is an important reference for the textile industry and those researching this important topic Reviews government regulations and consumer expectations about environmental impact on the textiles industry Discusses ways of achieving more sustainable materials and technologies as well as textiles recycling Examines how sustainability can be

integrated into textile design production and processes *Furniture flame retardancy partnership environmental profiles of chemical flameretardant alternatives for lowdensity polyurethane foam* ,2005 **Update on Flame Retardant Textiles**

Jenny Alongi,2013-11-11 This book describes the progress in flame retardancy of both natural and synthetic fibres fabrics moving from the traditional approaches back coating techniques current chemical solutions P N S B based flame retardants to the novel up to date strategies deposition and or assembly of architectures plasma treatments sol gel processes More specifically the fundamental aspects the chemistry of current flame retardant textile technologies including back coating process and the obtained improvements are thoroughly reviewed taking into account the detrimental environmental effects due to the use of halogen based additives such as bromine derivatives Then an overview of the chemical development of flame retardant strategies based on halogen free compounds is summarized The third part of the book is devoted to a description of the up to date innovative solutions based on nanotechnology The surface deposition of coatings having a different chemical structure is highlighted in detail To this aim the effect of nano architectures derived from nano particle adsorption plasma deposition grafting layer by layer assembly sol gel treatments on fibres fabrics is thoroughly discussed

Pentabromodiphenyl Ether as a Global POP Johanna Peltola,2001 **Evaluating Chemical and Other Agent Exposures for Reproductive and Developmental Toxicity** National Research Council,Commission on Life Sciences,Board on Environmental Studies and Toxicology,Committee on Toxicology,Subcommittee on Reproductive and Developmental Toxicology,2001-04-13 The United States Navy has been concerned for some time with protecting its military and civilian personnel from reproductive and developmental hazards in the workplace As part of its efforts to reduce or eliminate exposure of Naval personnel and their families to reproductive and developmental toxicants the Navy requested that the National Research Council NRC recommend an approach that can be used to evaluate chemicals and physical agents for their potential to cause reproductive and developmental toxicity The NRC assigned this project to the Committee on Toxicology which convened the Subcommittee on Reproductive and Developmental Toxicology to prepare this report In this report the subcommittee recommends an approach for evaluating agents for potential reproductive and developmental toxicity and demonstrates how that approach can be used by the Navy This report has been reviewed in draft form by individuals chosen for their diverse perspectives and technical expertise in accordance with procedures approved by the NRC s Report Review Committee The purpose of this independent review is to provide candid and critical comments that will assist the institution in making its published report as sound as possible and to ensure that the report meets institutional standards for objectivity evidence and responsiveness to the study charge The review comments and draft manuscript remain confidential to protect the integrity of the deliberative process We wish to thank the following individuals for their review of this report James Chen National Center for Toxicological Research George Daston Procter and Gamble Company Jerry Heindel National Institute of Environmental Health Sciences Grace Lemasters University of Cincinnati and John Young

National Center for Toxicological Research **Biomarkers in Toxicology** Ramesh C Gupta, 2019-02-13 Biomarkers in Toxicology Second Edition is a timely and comprehensive reference dedicated to all aspects of biomarkers that relate to chemical exposure and their effects on biological systems This revised and completely updated edition includes both vertebrate and non vertebrate species models for toxicological testing and the development of biomarkers Divided into several key sections this reference volume contains new chapters devoted to topics in microplastics neuroimmunotoxicity and nutraceuticals along with a look at the latest cutting edge technologies used to detect biomarkers Each chapter contains several references to current literature and important resources for further reading Given this comprehensive treatment this book is an essential reference for anyone interested in biomarkers across the scientific and biomedical fields Evaluates the expansive literature providing one resource covering all aspects of toxicology biomarkers Includes completely revised chapters along with additional chapters on the newest developments in the field Identifies and discusses the most sensitive accurate unique and validated biomarkers used as indicators of exposure Covers special topics and applications of biomarkers including chapters on molecular toxicology biomarkers biomarker analysis for nanotoxicology development of biomarkers for drug efficacy evaluation and much more **Reviews of Environmental Contamination and Toxicology** David M. Whitacre, 2012-09-19 Reviews of Environmental Contamination and Toxicology attempts to provide concise critical reviews of timely advances philosophy and significant areas of accomplished or needed endeavor in the total field of xenobiotics in any segment of the environment as well as toxicological implications **Veterinary Toxicology** Ramesh C. Gupta, 2012-03-15 1e dr 2007 [Financial Services and General Government Appropriations for 2011: CPSC; Election Assistance Commission; FCC](#) United States. Congress. House. Committee on Appropriations. Subcommittee on Financial Services and General Government, 2010 **Toxicological Profile for Polybrominated Biphenyls and Polybrominated Diphenyl Ethers** , 2004 **Brominated Flame Retardants: A Burning Issue** , **Reproductive and Developmental Toxicology** Ramesh C. Gupta, 2017-03-24 Reproductive and Developmental Toxicology Second Edition is a comprehensive and authoritative resource that provides the latest literature on this complex subject with a primary focus on three core components parent placenta and fetus and the continuous changes that occur in each Enriched with relevant references describing every aspect of reproductive toxicology this revised and updated resource addresses the totality of the subject discussing a broad range of topics including nanoparticles and radiation gases and solvents smoking alcohol and drug abuse and metals amongst others With a special focus on placental toxicity this book is the only available reference to connect the three key risk stages also including discussions on reproductive and developmental toxicity in domestic animals fish and wildlife Completely revised and updated to include the most recent developments in the field the book is an essential resource for advanced students and researchers in toxicology as well as biologists pharmacologists and teratologists from academia industry and regulatory agencies Provides a complete up to date integrated source of information on the key risk

stages during reproduction and development Includes new chapters covering significant developments such as dose response assessment for developmental toxicity juvenile toxicity and neural tube defects as well as emerging science such as stem cell application toxicoproteomics metabolomics endocrine disruption surveillance and regulatory considerations and risk assessment Offers diverse and unique in vitro and in vivo toxicity models for reproductive and developmental toxicity testing in a user friendly format that assists in comparative analysis

Draft Toxicological Profile for Phosphate Ester Flame Retardants ,2009 **Product Safety & Liability Reporter** ,2003 **Encyclopedia of Polymer Science and Technology** , v. 9. **Acrylic fibers to ethylene oxide polymers** ,2004

Unveiling the Energy of Verbal Beauty: An Mental Sojourn through **Toxicological Risks Of Selected Flame Retardant Chemicals**

In some sort of inundated with displays and the cacophony of immediate interaction, the profound power and psychological resonance of verbal beauty often disappear into obscurity, eclipsed by the regular assault of sound and distractions. Yet, situated within the lyrical pages of **Toxicological Risks Of Selected Flame Retardant Chemicals**, a charming perform of fictional elegance that pulses with raw thoughts, lies an wonderful trip waiting to be embarked upon. Written with a virtuoso wordsmith, that magical opus instructions visitors on a psychological odyssey, softly revealing the latent possible and profound influence stuck within the intricate internet of language. Within the heart-wrenching expanse of this evocative analysis, we can embark upon an introspective exploration of the book is central subjects, dissect their fascinating publishing style, and immerse ourselves in the indelible impression it leaves upon the depths of readers souls.

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