Biomass Smoke and Health RisksÂ– The Situation in Developing Countries

Paper Summary

SUMMARY PASSAGE 1

Preface

In addition, humans and their indoor activities such as cooking, cleaning, building renovation and tobacco smoking generate high levels and wide varieties of VOCs. Apart from these indoor sources, intrusions of VOCs from outdoor traffic as well as biogenic and industrial emissions contribute significantly to indoor VOC levels. Furthermore, indoor air reactions are now recognised as sources of indoor VOCs, as exemplified by the reaction of ozone with 4-phenylcyclohexene in carpets and with latex paints to generate appreciable amounts of aldehydes [4].

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Other Indoor Pollutants

Among the non-vapor-phase organic pollutants studied for indoor sink effects are NO 2 , ozone, and particles. Some of the earliest work on indoor sink effects was associated with combustion source emissions, namely NO 2 . In 1989, Spicer et al.

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Factors Determining Indoor Concentrations

In Germany the usage of PCP for wood preservation indoors ceased in 1978. A decrease in the concentrations in indoor air and house dust was observed thereafter. The trend for the years 1986-1994 is displayed in Fig. 2.

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Summary

Keywords Indoor air pollution Â· Indoor particles Â· Environmental tobacco smoke Â· Fibres Â· Dust 1 There is a significant variation between particles generated not only by different sources, but even by the same type of source. The most significant indoor sources are smoking, cooking and occupant movement.

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Origins Of Indoor Airborne Particles

Similarly, re-entrainment of settled dust to the air is represented by resuspension rates. Emission factors and emission rates vary significantly Indoor Particles, Combustion Products and Fibres not only between different types of sources but also between sources of the same type. Certain sources, for example, cooking or smoking, or activities such as walking are always associated with relatively high emission factors or rates, and thus always contribute in a measurable way to indoor concentration levels of particles [4].

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Particle Sizes And Size Distribution

For example, in urban outdoor air where motor vehicle emissions are a dominant pollution source, over 80% of particulate matter in terms of number is in the ultrafine range [17]. Since outdoor particles contribute significantly to indoor particle concentrations, also in indoor air particle number concentration is usually dominated by the smallest particles. However, most of the mass of airborne particles is associated with large particles since the mass of ultrafine particles is often very small in comparison with the mass of larger particles.

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Bioaerosols

A certain fraction of particles in indoor and outdoor air is of biological origin. In addition to particles, some volatile organic compounds are also of microbial origin (MVOC). According to the definition formulated at the IGAP workshop in Geneva in June 1993,"Biological Aerosol Particles (BAP) describe airborne solid particles (dead or alive) that are or were derived from living organism, including micro-organisms and fragments of varieties of living things" [20].

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Dust

Owing to the different origin of dust, samples collected from different indoor environments vary significantly in composition. For example, the dust from kindergartens most commonly consists almost completely of inorganic materials such as sand loam and clay from sand pits, while house dust from the residences of animal owners having at the same time heavy abrasion of carpets can consist virtually solely of organic material [4]. By contrast, dust collected in offices contains the following components: microorganisms, endotoxins, allergens, minerals and adsorbed organic compounds [36].

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Indoor Air Sources

It contains information on some HVAC components but the more prevalent information refers to construction materials.A balance of the type of materials tested and of how many tests were performed during the two major campaigns in the development process of SOPHIE is made in Table 6. Those materials were tested according to standard procedures for testing chambers [53] and for chemical analysis [54].A sensory assessment was also performed. Two product Sensory Evaluation of Indoor Air Pollution Sources 207 Flooring 56 53 14 55 57 28 57 Wall 33 26 5 29 14 0 14 Ceiling 2 2 0 2 0 0 0 Construction 14 10 3 14 17 8 17 Other 14 13 2 14 11 6 11 Heating, 16 18 0 0 39 0 0 ventilation and airconditioning components a 1994-1997 85 86 24 68 106 32 67 1998-2000 50 46 0 46 32 10 32 a Tests not related to time but to air volume.

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Concluding Recommendations

The emission of various air pollutants into indoor environments brings about severe indoor air pollution. There is a strong desire to regulate and reduce the levels of these pollutants. To address the challenges, we note some policy problems and make the following concluding recommendations.