

EMERGING CHEMICALS OF CONCERN: SOURCES, FATES AND EFFECTS

Ming H. Wong^{1,2}

¹School of Environmental and Resource Sciences, Zhejiang A & F University, Linan, PR China,

²Croucher Institute for Environmental Sciences, Hong Kong Baptist University, PR China

ABSTRACT

“Silent Spring” (Carson, 1962) is often cited as the beginning of the environmental movement, stating the dangers of organochlorine pesticides such as DDT, thus raising a controversial issue on whether we should keep on seeking a higher living standard through technical innovation, or address the unintended consequences of such innovation. Out of the 60 million organic and inorganic substances registered (as of 27 June, 2011), 48 million are commercially available, but only 280,000 are inventoried or regulated chemicals (Chemical Abstracts Service Registry, 2011). Adverse environmental and health effects of a large number of these synthetic chemicals thought to be harmless when they were introduced to the market have been gradually reported. The term “Emerging Chemicals of Concern” is therefore a moving target, which is dependent on time and location (Wijbenga & Hutzinger, 1984). The book “Our Stolen Future” (Colborn et al, 1996) further brought public attention to the endocrine disruptive effects of some of these chemicals (such as flame retardants, bisphenol A and phthalates commonly used in daily appliances) which interfere with the hormonal system controlling development of the fetus. The adverse impacts such as lowered immunity and fertility, and compromised intelligence and behavior in their later life, due to early exposure to these chemicals, pose important challenges on the proper management of chemicals in the environment. This presentation attempts to review the current status of some common emerging chemicals of concern in different ecological compartments, and their biogeochemical cycles in the environment, with emphasis on relevant food safety and health issues, by citing some examples related to the Pearl River Delta, South China, the world’s mega site for manufacturing electrical and electronic products. Some management issues of these emerging chemicals are also discussed (Bouwman et al, 2011).

References

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