

A comparison of the use of environmental friendly household cleaning products in Southern California and Southern Guangdong

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Southern California and Southern Guangdong represent respectively the highly populated areas in USA and China. These two regions are situated on the two sides of the Pacific Rim. They serve as the major terminals for cargo containers between the two countries. Port of Long Beach handles more than 3.8 million 20-foot long equivalent containers annually, of which more than 50% are from China. Since early 1980, the South China Sea Institute of Oceanology, Chinese Academy of Science in Guangzhou has cooperated with California State University, Long Beach in various collaborative environmental projects of common interest. These two regions have similar growth patterns. With the link of freeways and urban growth, they have gradually evolved as giant metropolitan complexes with many neighboring cities sharing the valuable coastal zone. However, industrial and domestic waste discharges may severely affect the local environment, especially in the harbors, deltas and bays. In some uncontrolled areas, the surface runoff is discharged without any treatment. Study of sediment toxicity for the Southern California Bight showed that at least 18% of the regions in the harbors and bays are classified as "concerned". This means that the areas have significantly impaired sediment quality (Bay and Armstrong, 1999). One major chemical discharged from the domestic waste comes from cleaning products used by every household. Our present study provides a glimpse of the use of green or environmental friendly chemical products in these two regions. The Products and Research Division of the South China Sea Institute is highly concerned with the promotion of such green compounds in the local region. This paper will provide a basis for the future research guidelines on the green chemicals so as to better service to the communities.

The use of soap in China has probably the longest historical record. Its disadvantage as a cleaning agent is the formation of insoluble products with divalent cations. However, soap does not cause any substantial environmental hazards, except for the formation of scum. Household cleansing chemicals are highly competitive in the supermarkets and stores. Their volume of sale and their resulting profit are highly lucrative. Manufacturers have since produced a variety of chemicals for consumers. The use of detergent, in the form of an alkyl aryl sulfonate, has the problem of being very slowly biodegradable. Very often high beds of foam would appear nearby discharge point or an outfall. Subsequently a more easily biodegradable type of detergent in the form of benzenesulfonate becomes more popular. The use of solid type detergent, which contains at least 25 to 40% phosphates, has the most concern as an environmental pollutant. Phosphate has been directly linked to the algal growth. (Manahan, 1972). In our survey, those commercially readily available household cleaning chemicals are analyzed and compared with their degree of hazard and toxicity to the environment. Their degree of biodegradability has been estimated from the biochemical and chemical oxygen demand. The differences and similarities in the use of household chemicals in the two regions have been compared. The promotion of green chemicals for ordinary household consumption should be encouraged through the consumer education channel.

Bay, Steven and Armstrong, Jeff. (1999) Comparison of sediment toxicity measures for the Southern California Bight. 532-533 in Proceeding of Coastal Zone, Urban Harbor Institute, University of Massachusetts, Boston (Ed.)

Manahan, Stanley E. (1972) Chapter 7 in Environmental Chemistry. Willard Grant Press, Boston, Mass.