

skin, and lungs, and at high levels may cause pulmonary damage. However, EPA believes that methyl formate is well regulated by other programs; therefore, exposures to this compound will be below levels of concern. OSHA has established an enforceable occupational exposure limit of 100 ppm as an 8-hr time-weighted average. NIOSH has also established a short-term exposure limit (averaged over 15 mins) of 150 ppm. There is only one supplier of methyl formate in the U.S., and their total production is less than 10 million pounds per year. We estimate that use of methyl formate as an HCFC replacement in the foam sector will be relatively small, reaching 2.5 million pounds between 2008–2010. Although we do not have information on all the possible exposure scenarios to methyl formate, based on information provided by industry, the air concentration levels reached in testing methyl formate as a foam blowing agent have been less than 10 ppm (without ventilation), a concentration well below the occupational exposure limits.

The four compounds will continue to be VOC for purposes of all record keeping, emissions reporting, and inventory requirements which apply to VOC. The EPA believes that it is important to continue collecting data on new exempt organic compound emissions for the following reasons:

(a) EPA wants to investigate the possibility that some compounds classified as “negligibly reactive” or which are not defined as VOC for purposes of VOC emissions limitations or VOC content requirements may, in fact, contribute to ozone formation under certain conditions, especially if there are large amounts of such emissions;

(b) EPA wants to investigate whether significant aggregate emissions of “negligibly reactive” compounds or of compounds which are not defined as VOC for purposes of VOC emissions limitations or VOC content requirements may contribute to multi-day ozone events and to ozone transport;

(c) EPA believes that in order to have more accurate modeling, it may be necessary to keep track of exempt compound emissions, especially if there are large amounts of such emissions;

(d) EPA is now in the process of assessing its VOC policy in general, and its VOC exemption policy in particular, and data about the impacts of VOC exemptions on such things as the volume of exempt compound use, the effects of an exemption on ambient ozone conditions, and the verification of VOC substitution are critical

information that can only be obtained through continued record keeping and reporting. We intend to publish a future notice inviting public comment on the VOC exemption policy and the concept of negligible reactivity as part of a broader review of overall policy.

Also, we are proposing to make a nomenclature clarification to two previously exempted compounds. We propose to add the designations HFE–7100 to 1,1,1,2,2,3,3,4,4-nonafluoro-4-methoxy-butane (C_4F_9OH) and HFE–7200 to 1-ethoxy-1,1,2,2,3,3,4,4,4-nonafluorobutane ($C_4F_9OCH_2H_5$). These names are widely accepted alternative designations for the two compounds and can be found in the book titled, *Handbook for Critical Cleaning* by Barbara Kanegsberg and Edward Kanegsberg, CRC Press, 2001, p. 77.

To determine whether your organization is regulated by this action, you should carefully examine the applicability criteria in § 51.100 of title 40 of the Code of Federal Regulations. If you have questions regarding the applicability of this action to a particular entity, consult the person listed in the preceding **FOR FURTHER INFORMATION CONTACT** section.

I. Background

Tropospheric ozone, commonly known as smog, occurs when VOCs and nitrogen oxides (NO_x) react in the atmosphere. Because of the harmful health effects of ozone, EPA and State governments limit the amount of VOCs and NO_x that can be released into the atmosphere. Volatile organic compounds are those compounds of carbon (excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate) which form ozone through atmospheric photochemical reactions. Compounds of carbon (also known as organic compounds) have different levels of reactivity—that is, they do not react at the same speed or do not form ozone to the same extent. It has been EPA’s policy that organic compounds with a negligible level of reactivity need not be regulated to reduce ozone. The EPA determines whether a given organic compound has “negligible” reactivity by comparing the compound’s reactivity to the reactivity of ethane. The EPA lists these compounds in its regulations (at 40 CFR 51.100(s)) and excludes them from the definition of VOCs. The chemicals on this list are often called “negligibly reactive” organic compounds.

In 1977, EPA published the “Recommended Policy on Control of Volatile Organic Compounds” (42 FR 35314) which established the basic

policy that EPA has used regarding organic chemical photochemical reactivity since that time. In that statement, EPA identified the following four compounds as being of negligible photochemical reactivity and said these should be exempt from regulation under SIPs: methane; ethane; 1,1,1-trichloroethane (methyl chloroform); 1,1,2-trichloro-1,2,2-trifluoroethane (CFC–113). That policy statement said that as new information becomes available, EPA may periodically revise the list of negligibly reactive compounds to add compounds to or delete them from the list.

The EPA’s decision to exempt certain compounds in its 1977 policy was heavily influenced by experimental smog chamber work done earlier in the 1970’s. In this experimental work, various compounds were injected into a smog chamber at a molar concentration that was typical of the total molar concentration of VOC in Los Angeles ambient air (4 ppmv). As the compound was allowed to react with NO_x at concentrations of 0.2 ppm, the maximum ozone formed in the chamber was measured. If the compound in the smog chamber did not result in ozone formation of 0.08 ppm (0.08 ppm was the NAAQS for oxidants at that time), it was assumed that emissions of the compound would not cause the oxidant standard to be exceeded. The compound could then be considered to be negligibly reactive. Ethane was the most reactive compound tested that did not cause the 0.08 ozone level in the smog chamber to be met or exceeded. Based on those findings and judgments, EPA designated ethane as negligibly reactive, and ethane became the benchmark VOC species separating reactive from negligibly reactive compounds.

Since 1977, the primary method for comparing the reactivity of a specific compound to that of ethane has been to compare the k_{OH} values for ethane and the specific compound of interest. The k_{OH} value represents the molar rate constant for reactions between the subject compound (e.g., ethane) and the hydroxyl radical (i.e., $\cdot OH$). This reaction is very important since it is the primary pathway by which most organic compounds initially participate in atmospheric photochemical reaction processes. The EPA has exempted 45 compounds or classes of compounds based on a comparison of k_{OH} values since 1977.

In 1994, in response to a petition to exempt volatile methyl siloxanes, EPA, for the first time, considered a comparison to ethane based on incremental reactivity (IR) metrics (59 FR 50693, October 5, 1994). The use of