6560-50-P

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 51

[EPA-HQ-OAR-2015-0041; FRL-9949-77-OAR]

RIN 2060-AR94

Air Quality: Revision to the Regulatory Definition of Volatile Organic Compounds – Exclusion of 1,1,2,2-Tetrafluoro-1-(2,2,2-trifluoroethoxy) ethane (HFE-347pcf2)

AGENCY: Environmental Protection Agency (EPA).

ACTION: Direct final rule.

SUMMARY: The Environmental Protection Agency (EPA) is taking direct final action to revise the regulatory definition of volatile organic compounds (VOC) under the Clean Air Act (CAA). This direct final action adds 1,1,2,2-Tetrafluoro-1-(2,2,2-trifluoroethoxy) ethane (also known as HFE-347pcf2; CAS number 406-78-0) to the list of compounds excluded from the regulatory definition of VOC on the basis that this compound makes a negligible contribution to tropospheric ozone (O_3) formation.

DATES: This rule is effective on **[INSERT DATE 60 DAYS AFTER PUBLICATION IN THE *FEDERAL REGISTER*]** without further notice, unless the EPA receives adverse comment by **[INSERT DATE 30 DAYS AFTER PUBLICATION IN THE *FEDERAL REGISTER*]**. If the EPA receives adverse comment, we will publish a timely withdrawal in the *Federal Register* informing the public that the rule will not take effect.

ADDRESSES: Submit your comments, identified by Docket ID No. EPA-HQ-OAR-2015-0041, at http://www.regulations.gov. Follow the online instructions for submitting comments. Once submitted, comments cannot be edited or removed from Regulations.gov. The EPA may publish any comment received to its public docket. Do

not submit electronically any information you consider to be Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Multimedia submissions (audio, video, etc.) must be accompanied by a written comment. The written comment is considered the official comment and should include discussion of all points you wish to make. The EPA will generally not consider comments or comment contents located outside of the primary submission (i.e. on the web, cloud, or other file sharing system). For additional submission methods, the full EPA public comment policy, information about CBI or multimedia submissions, and general guidance on making effective comments, please visit http://www2.epa.gov/dockets/commenting-epa-dockets.

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SUPPLEMENTARY INFORMATION:

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I. Why is the EPA using a direct final rule?

The EPA is publishing this direct final rule without a prior proposed rule because we view this as a noncontroversial action and anticipate no adverse comment. This action revises the EPA's regulatory definition of VOC for purposes of preparing state implementation plans (SIPs) to attain the national ambient air quality standards (NAAQS) for O_3 under title I of the CAA by adding HFE-347pcf2 to the list of compounds excluded from the regulatory definition of VOC on the basis that this compound makes a negligible contribution to tropospheric O_3 formation. However, in the "Proposed Rules" section of this *Federal Register*, we are publishing a separate document that will serve as the proposed rule to make this revision to the regulatory definition of VOC if adverse comments are received on this direct final rule. We will not institute a second comment period on this action. Any parties interested in commenting must do so at this time. For further information about commenting on this rule, see the **ADDRESSES** section of this document.

If the EPA receives adverse comment, we will publish a timely withdrawal in the *Federal Register* informing the public that this direct final rule will not take effect. We would address all public comments in any subsequent final rule based on the proposed rule.

II. Does this action apply to me?

Entities potentially affected by this direct final rule include, but are not necessarily limited to: state and local air pollution control agencies that adopt and implement regulations to control air emissions of VOC; and industries manufacturing and/or using HFE-347pcf2 as a precision cleaning agent to remove contaminants including oil, flux, and fingerprints from items like medical devices, artificial implants, crucial military and aerospace items, electric components, printed circuit boards, optics, jewelry, ball bearings, aircraft guidance systems, film, relays, and a variety of metal components, among others.

III. Background

A. The EPA's VOC Exemption Policy

Tropospheric O_3, commonly known as smog, is formed when VOC and nitrogen oxides (NOx) react in the atmosphere in the presence of sunlight. Because of the harmful health effects of O_3, the EPA and state governments limit the amount of VOC that can be released into the atmosphere. Volatile organic compounds form O_3 through atmospheric photochemical reactions, and different VOC have different levels of reactivity. That is, different VOC do not react to form O_3 at the same speed or do not form O_3 to the same extent. Some VOC react slowly or form less O_3; therefore, changes in their emissions have limited effects on local or regional O_3 pollution episodes. It is the EPA's policy that

organic compounds with a negligible level of reactivity should be excluded from the regulatory definition of VOC in order to focus VOC control efforts on compounds that significantly increase O_3 concentrations. The EPA also believes that exempting such compounds creates an incentive for industry to use negligibly reactive compounds in place of more highly reactive compounds that are regulated as VOC. The EPA lists compounds that it has determined to be negligibly reactive in its regulations as being excluded from the regulatory definition of VOC (40 CFR 51.100(s)).

The CAA requires the regulation of VOC for various purposes. Section 302(s) of the CAA specifies that the EPA has the authority to define the meaning of "VOC" and, hence, what compounds shall be treated as VOC for regulatory purposes. The policy of excluding negligibly reactive compounds from the regulatory definition of VOC was first laid out in the "Recommended Policy on Control of Volatile Organic Compounds" (42 FR 35314, July 8, 1977) (from here forward referred to as the 1977 Recommended Policy) and was supplemented subsequently with the "Interim Guidance on Control of Volatile Organic Compounds in Ozone State Implementation Plans" (70 FR 54046, September 13, 2005) (from here forward referred to as the 2005 Interim Guidance). The EPA uses the reactivity of ethane as the threshold for determining whether a compound has negligible reactivity. Compounds that are less reactive than, or equally reactive to, ethane under certain assumed conditions may be deemed negligibly reactive and, therefore, suitable for exemption from the regulatory definition of VOC. Compounds that are more reactive than ethane continue to be considered VOC for regulatory purposes and, therefore, are subject to control requirements. The selection of ethane as the

threshold compound was based on a series of smog chamber experiments that underlay the 1977 policy.

The EPA has used three different metrics to compare the reactivity of a specific compound to that of ethane: (i) the rate constant for reaction with the hydroxyl radical (OH) (known as k_{OH}); (ii) the maximum incremental reactivity (MIR) on a reactivity per unit mass basis; and (iii) the MIR expressed on a reactivity per mole basis. Differences between these three metrics are discussed below.

The k_{OH} is the rate constant of the reaction of the compound with the OH radical in the air. This reaction is often, but not always the first and rate-limiting step in a series of chemical reactions by which a compound breaks down in the air and contributes to O_3 formation. If this step is slow, the compound will likely not form O_3 at a very fast rate. The k_{OH} values have long been used by the EPA as metrics of photochemical reactivity and O_3-forming activity, and they have been the basis for most of the EPA's early exemptions of negligibly reactive compounds from the regulatory definition of VOC. The k_{OH} metric is inherently a molar-based comparison, *i.e.*, it measures the rate at which molecules react.

The MIR, both by mole and by mass, is a more updated metric of photochemical reactivity derived from a computer-based photochemical model, and has been used as a consideration of reactivity since 1995. This metric considers the complete O_3-forming activity of a compound over multiple hours and through multiple reaction pathways, not merely the first reaction step with OH. Further explanation of the MIR metric can be found in Carter (1994), "Development of ozone reactivity scales for volatile organic compounds."

The EPA has considered the choice between a molar or mass basis for the comparison to ethane in past rulemakings and guidance. In the 2005 Interim Guidance, the EPA stated:

> [A] comparison to ethane on a mass basis strikes the right balance between a threshold that is low enough to capture compounds that significantly affect ozone concentrations and a threshold that is high enough to exempt some compounds that may usefully substitute for more highly reactive compounds.
>
> When reviewing compounds that have been suggested for VOC-exempt status, EPA will continue to compare them to ethane using k_{OH} expressed on a molar basis and MIR values expressed on a mass basis.

The 2005 Interim Guidance also noted that concerns have sometimes been raised about the potential impact of a VOC exemption on environmental endpoints other than O_3 concentrations, including fine particle formation, air toxics exposures, stratospheric O_3 depletion, and climate change. The EPA has recognized, however, that there are existing regulatory and non-regulatory programs that are specifically designed to address these issues, and the EPA continues to believe in general that the impacts of VOC exemptions on environmental endpoints other than O_3 formation will be adequately addressed by these programs. The VOC exemption policy is intended to facilitate attainment of the O_3 NAAQS. In general, VOC exemption decisions will continue to be based solely on consideration of a compound's contribution to O_3 formation. However, if the EPA determines that a particular VOC exemption is likely to result in a significant increase in the use of a compound and that the increased use would pose a significant risk to human health or the environment that would not be addressed adequately by existing programs or policies, then the EPA may exercise its judgment accordingly in deciding whether to grant an exemption.

B. Petition to List HFE-347pcf2 as an Exempt Compound

Asahi Glass Company, AGC Chemicals America, Inc. submitted a petition to the EPA on February 5, 2007, requesting that 1,1,2,2-Tetrafluoro-1-(2,2,2-trifluoroethoxy) ethane (HFE-347pcf2; CAS number 406-78-0) be exempted from the regulatory definition of VOC. The petition was based on the argument that HFE-347pcf2 has low reactivity relative to ethane. The petitioner indicated that HFE-347pcf2 may be used in a variety of applications as a precision cleaning agent to remove contaminants including oil, flux, and fingerprints from items like medical devices, artificial implants, crucial military and aerospace items, electric components, printed circuit boards, optics, jewelry, ball bearings, aircraft guidance systems, film, relays, and a variety of metal components, among others.

To support its petition, AGC Chemicals America, Inc. referenced several documents, including two peer-reviewed journal articles on HFE-347pcf2's reaction rates (Tokuhashi *et al*., 2000; Pitts *et al*, 1983). In 2014, AGC provided a supplemental technical report on the maximum incremental reactivity of HFE-347pcf2 (Carter, 2014). According to this report, the maximum incremental reactivity of HFE-347pcf2 ranges between 0.0007 g O_3/g HFE-347pcf2 (best estimate) and 0.0013 g O_3/g HFE-347pcf2 (high reactivity estimate) on the mass-based MIR scale. This reactivity rate is much lower than that of ethane (0.28 g O_3/g ethane), the compound that the EPA has used for comparison to define "negligible" O_3 reactivity for the purpose of exempting compounds from the regulatory definition of VOC. The rate constant for the gas-phase reaction of OH radicals with HFE-347pcf2 (k_{OH}) has been measured to be 9.16×10^{-15} cm^3/molecule-sec at ~298 K (Pitts *et al.*, 1983, Tokuhashi *et al.*, 2000). Based on the measured reactivity rate of HFE-347pcf2 (Pitts *et al.*, 1983), HFE-347pcf2 has a smaller k_{OH} than

ethane (k_{OH} of ethane = 2.4 x 10^{-13} cm^3/molecule-sec at ~298 K) and, therefore, is less reactive than ethane.

To address the potential for stratospheric O_3 impacts, the petitioner contended that, given the atmospheric lifetime of HFE-347pcf2 and that it does not contain chlorine or bromine, it is not expected to contribute to the depletion of the stratospheric O_3 layer.

IV. The EPA's Assessment of the Petition

The EPA is taking direct final action to respond to the petition by exempting HFE-347pcf2 from the regulatory definition of VOC. This action is based on consideration of the compound's low contribution to tropospheric O_3 and the low likelihood of risk to human health or the environment. In this case, the EPA considered issues of contribution to stratospheric O_3 depletion, toxicity, and climate change. Additional information on these topics is provided in the following sections.

A. Contribution to Tropospheric Ozone Formation

The reaction rate of HFE-347pcf2 with the OH radical (k_{OH}) has been measured to be 9.16 x 10^{-15} cm^3/molecule-sec (Tokuhashi *et al.*, 2000); other reactions with O_3 and the nitrate radical were negligibly small. The corresponding reaction rate of ethane with OH is 2.4 x 10^{-13} cm^3/molecule-sec (Atkinson *et al.*, 2006).

The overall atmospheric reactivity of HFE-347pcf2 was not studied in an experimental smog chamber, but the chemical mechanism derived from other chamber studies (Carter, 2011) was used to model the complete formation of O_3 for an entire single day under realistic atmospheric conditions (Carter, 2014). In 2014, Carter calculated a MIR value of 0.0007 to 0.0013 g O_3/g VOC for HFE-347pcf2 for "averaged conditions," versus 0.28 g O_3/g VOC for ethane.

Table 1 presents the three reactivity metrics for HFE-347pcf2 as they compare to ethane.

Table 1 - Reactivities of ethane and HFE-347pcf2			
Compound	**k_{OH} (cm^3/molecule-sec)**	**Maximum incremental reactivity (MIR) (g O_3/mole VOC)**	**Maximum incremental reactivity (MIR) (g O_3/g VOC)**
Ethane	2.4×10^{-13}	8.4	0.28
HFE-347pcf2	9.16×10^{-15}	0.14-0.26	0.0007-0.0013

Notes:

1. k_{OH} value at 298 K for ethane is from Atkinson *et al*., 2006 (page 3626).
2. k_{OH} value at 298 K for HFE-347pcf2 is from Tokuhashi, 2000.
3. Mass-based MIR value (g O_3/g VOC**)** of ethane is from Carter, 2011.
4. Mass-based MIR value (g O_3/g VOC**)** of HFE-347pcf2 is from a supplemental report by Carter, 2014.
5. Molar-based MIR (g O_3/mole VOC) values were calculated from the mass-based MIR (g O_3/g VOC) values using the number of moles per gram of the relevant organic compound.

The data in Table 1, shows that HFE-347pcf2 has a significantly lower k_{OH} value than ethane, meaning that it initially reacts less quickly in the atmosphere than ethane. Also, a molecule of HFE-347pcf2 is less reactive than a molecule of ethane in terms of complete O_3-forming activity as shown by the molar-based MIR (g O_3/mole VOC) values. Additionally, one gram of HFE-347pcf2 has a lower capacity than one gram of ethane to form O_3. Thus, following the 2005 Interim Guidance, HFE-347pcf2 is eligible to be exempted from the regulatory definition of VOC on the basis of k_{OH} and both the mole- and mass-based MIR.

B. Contribution to Stratospheric Ozone Depletion

HFE-347pcf2 is unlikely to contribute to the depletion of the stratospheric O_3 layer. The O_3 depletion potential (ODP) of HFE-347pcf2 is expected to be negligible based on several lines of evidence: the absence of chlorine or bromine from the compound, the expected initial reactions described in Carter (2008), and the general

theory supporting the estimated mechanisms of its reactivity with the hydroxyl OH discussed in Carter (2011).

The Significant New Alternatives Policy (SNAP) program is the EPA's program to evaluate and regulate substitutes for end uses historically using ozone-depleting chemicals. Under Section 612(c) of the CAA, the EPA is required to identify and publish lists of acceptable and unacceptable substitutes for class I or class II ozone-depleting substances. According to the SNAP program finding, the HFE-347pcf2 ODP is zero and therefore HFE-347pcf2 is listed as an acceptable substitute for several of these ozone-depleting chemicals in electronics and precision cleaning and as an aerosol solvent in 2012.[1]

C. Toxicity

Based on a screening assessment of the health and environmental risks of HFE-347pcf2 (available in the docket for the SNAP rule at EPA–HQ–OAR– 2003–0118 under the name, ''Risk Screen on Substitutes CFC-113, Methyl Chloroform, and HCFC-141b in Aerosol Solvent, Electronics Cleaning, and Precision Cleaning Substitute: HFE-347pcf2"), the SNAP program anticipated that users will be able to use the compound in precision cleaning without significantly greater health risks than presented by use of other available substitutes.

Potential health effects of HFE-347pcf2 include coughing, dizziness, dullness, drowsiness, and headache. Higher concentrations can produce heart irregularities, central nervous system depression, narcosis, unconsciousness, respiratory failure, or death. This

[1] 77 FR 47768, August 10, 2012. Also see list of acceptable cleaning solvents under SNAP decision: http://www.epa.gov/ozone/snap/solvents/solvents.pdf.

compound may also irritate the skin or eyes. The acute and short-term studies presented during the SNAP review indicated that HFE-347pcf2 is toxic by inhalation, and mortality was observed at high concentrations of 2000 ppm and above. HFE-347pcf2 is not commonly used outside of industrial settings, and other compounds in the same industrial uses have similar health and environmental risks. The SNAP program, in their listing of HFE-347pcf2 as an acceptable substitute in aerosol solvent, recommended that adequate ventilation and good industrial hygiene practice be utilized due to the potential neurotoxic effects of this substitute at high acute (short-term) concentrations. The manufacturer recommended an acceptable exposure limit (AEL) for the workplace of 50 ppm (8-hr total weight average, TWA). The EPA recommended a maximum allowable human exposure limit of 150 ppm for HFE-347pcf2. The EPA anticipates that users following good practices will be able to use HFE-347pcf2 in electronics and precision cleaning without appreciable health risks.

HFE-347pcf2 is not regulated as a hazardous air pollutant (HAP) under Title I of the CAA. Also, it is not listed as a toxic chemical under Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA).

The Toxic Substances Control Act (TSCA) gives the EPA authority to assess and prevent potential unreasonable risks to human health and the environment before a new chemical substance is introduced into commerce. Section 5 of TSCA requires manufacturers and importers to notify the EPA before manufacturing or importing a new chemical substance by submitting a pre-manufacture notice (PMN) prior to the manufacture (including import) of the chemical. Under the TSCA New Chemicals Program, the EPA then assesses whether an unreasonable risk may, or will, be presented

by the expected manufacture, processing, distribution in commerce, use, and disposal of the new substance. The PMN for HFE-347pcf2 stated the substance will be used in industrial settings for cleaning electronic components, precision cleaning, dewatering of electronic components and other parts following aqueous cleaning, and as a carrier/lubricant coating for hard disk drives and other precision parts. EPA did not determine that the above-listed proposed industrial processing or use of the substance presents an unreasonable risk. The EPA has determined, however, that domestic manufacture, use in non-industrial products, or use other than as described in the PMN may cause serious chronic health effects. To mitigate risks identified during the PMN review of HFE-347pcf2 (PMN P-04-0635), EPA issued a Significant New Use Rule (SNUR)[2] requiring that manufacturers notify the EPA prior to manufacture or processing of the compound for any new use other than those proposed in the PMN. The required notification will provide the EPA with the opportunity to evaluate the intended use and, if necessary, to prohibit or limit that activity before it occurs.

D. Contribution to Climate Change

The Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report (IPCC AR5) estimated the lifetime of HFE-347pcf2 to be 6.0 years and the radiative efficiency to be 0.48 $W/m^2/ppb$. The report estimated the resulting 100-year global warming potential (GWP) to be 889, meaning that, over a 100-year period, one ton of HFE-347pcf2 traps 889 times as much warming energy as one ton of CO_2 (IPCC, 2013).[3]

[2] 77 FR 61117 (Oct. 5, 2012): FR document, with preamble background. See 40 CFR 721.10549.

[3] The GWP value for HFE347-pcf-2 of 580 considered in the 2012 SNAP decision came from the previous IPCC report, AR4(IPCC, 2007). AR4 GWP values are still used in a

HFE-347pcf2's GWP of 889 is lower than some of the substitutes in the end uses for which it has been listed as acceptable under the SNAP program, such as HFC-4310mee (GWP = 1650), but higher than the GWP of some other substitutes, such as HFC-365mfc (GWP = 804), HFE-7100 (GWP = 421) and aqueous cleaners with no direct GWP. Under the SNAP program, the EPA continually reviews the availability of acceptable substitutes and expects to eventually eliminate higher-GWP chemicals from the list of acceptable compounds as safer, lower-GWP substitutes become available.

E. Conclusions

The EPA finds that HFE-347pcf2 is negligibly reactive with respect to its contribution to tropospheric O_3 formation and thus may be exempted from the EPA's definition of VOC in 40 CFR 51.100(s). HFE-347pcf2 has been listed as acceptable for use in electronic and precision cleaning and as an aerosol solvent under the SNAP program (USEPA, 2004). The EPA determined that HFE-347pcf2 has a similar or lower stratospheric O_3 depletion potential than available substitutes in those end uses and that the toxicity risk from using HFE-347pcf2 is not significantly greater than the risk from using other available alternatives. HFE-347pcf2, among other hydrofluoroethers, was found by both the Montreal Protocol's solvents, coatings, and adhesives technical options committee in 2002 and its technical and economic assessment panel in 2005, to be a suitable replacement for other, more harmful cleaning solvents (UNEP, 2002, 2005). HFE-347pcf2 is expected to be used primarily for the purposes regulated by the SNAP program. It is mostly replacing chemicals with higher GWP and the SNAP program will

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number of regulatory and reporting contexts to maintain consistency and allow for analysis of trends.

continue to evaluate its acceptability as an alternative for those specific uses, the EPA has concluded that non-tropospheric ozone-related risks associated with potential increased use of HFE-347pcf2 are adequately managed by this program. The EPA does not expect significant use of HFE-347pcf2 in applications not covered by the SNAP program. However, the SNUR in place under TSCA requires that any significant new use of the chemical be reported to EPA using a Significant New Use Notice (SNUN).

Any significant new use of HFE-347pcf2 would need to be evaluated by the EPA, and the EPA will continually review the availability of acceptable substitute chemicals from the list of acceptable compounds under the SNAP program as lower-GWP substitutes become available, which could lead to restrictions on the use of HFE-347pcf2, should safer, lower-GWP substitutes become available. At this time, SNAP does not anticipate further evaluation of HFE-347pcf2 to potentially remove the compound from the list of acceptable substitutes in the precision cleaning end-use largely because the use of the chemical is limited to a small niche market.

V. Direct Final Action

The EPA is responding to the petition by revising its regulatory definition of VOC at 40 CFR 51.100(s) to add HFE-347pcf2 to the list of compounds that are exempt from the regulatory definition of VOC because it is less reactive than ethane based on a comparison of k_{OH}, and mass-based MIR, and molar-based MIR metrics and is therefore considered negligibly reactive. As a result of this action, if an entity uses or produces any of this compound and is subject to the EPA regulations limiting the use of VOC in a product, limiting the VOC emissions from a facility, or otherwise controlling the use of VOC for purposes related to attaining the O_3 NAAQS, then this compound will not be

counted as a VOC in determining whether these regulatory obligations have been met. This action may also affect whether this compound is considered a VOC for state regulatory purposes to reduce O_3 formation if a state relies on the EPA's regulatory definition of VOC. States are not obligated to exclude from control as a VOC those compounds that the EPA has found to be negligibly reactive. However, no state may take credit for controlling this compound in its O_3 control strategy. Consequently, reduction in emissions for this compound will not be considered or counted in determining whether states have met the rate of progress requirements for VOC in SIPs or in demonstrating attainment of the O_3 NAAQS.

VI. Statutory and Executive Order Reviews

A. Executive Order 12866: Regulatory Planning and Review and Executive Order 13563: Improving Regulation and Regulatory Review

This action is not a significant regulatory action and was therefore not submitted to the Office of Management and Budget (OMB) for review.

B. Paperwork Reduction Act (PRA)

This action does not impose an information collection burden under the PRA. It does not contain any recordkeeping or reporting requirements.

C. Regulatory Flexibility Act (RFA)

I certify that this action will not have a significant economic impact on a substantial number of small entities under the RFA. This action will not impose any requirements on small entities. This action removes HFE-347pcf2 from the regulatory definition of VOC and thereby relieves manufacturers, distributers, and users of the compound from requirements to control emissions of the compound.

D. Unfunded Mandates Reform Act (UMRA)

This action does not contain any unfunded mandate as described in UMRA, 2 U.S.C. 1531-1538, and does not significantly or uniquely affect small governments. The action imposes no enforceable duty on any state, local or tribal governments, or the private sector.

E. Executive Order 13132: Federalism

This action does not have federalism implications. It will not have substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government.

F. Executive Order 13175: Consultation and Coordination with Indian Tribal Governments

This action does not have tribal implications, as specified in Executive Order 13175. This direct final rule removes HFE-347pcf2 from the regulatory definition of VOC and thereby relieves manufacturers, distributers and users from requirements to control emissions of the compound. Thus, Executive Order 13175 does not apply to this action.

G. Executive Order 13045: Protection of Children from Environmental Health and Safety Risks

This action is not subject to Executive Order 13045 because it is not economically significant as defined in Executive Order 12866, and because the EPA does not believe the environmental health or safety risks addressed by this action present a disproportionate risk to children. Since HFE-347pcf2 is utilized in specific industrial

applications where children are not present and dissipates quickly, there is no exposure or disproportionate risk to children. This action removes HFE-347pcf2 from the regulatory definition of VOC and thereby relieves manufacturers, distributers and users from requirements to control emissions of the compound.

H. Executive Order 13211: Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution or Use

This action is not subject to Executive Order 13211 because it is not a significant regulatory action under Executive Order 12866.

I. National Technology Transfer and Advancement Act (NTTAA)

This rulemaking does not involve technical standards.

J. Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations

The EPA believes that this action does not have disproportionately high and adverse human health or environmental effects on minority populations, low-income populations and/or indigenous peoples, as specified in Executive Order 12898 (59 FR 7629 February 16, 1994). This action removes HFE-347pcf2 from the regulatory definition of VOC and thereby relieves manufacturers, distributers, and users of the compound from requirements to control emissions of the compound.

K. Congressional Review Act (CRA)

This action is subject to the CRA, and the EPA will submit a rule report to each House of the Congress and to the Comptroller General of the United States. This action is not a "major rule" as defined by 5 U.S.C. 804(2).

L. Judicial Review

Under section 307(b)(1) of the CAA, petitions for judicial review of this action must be filed in the United States Court of Appeals for the District of Columbia Circuit Court within 60 days from the date the final action is published in the *Federal Register*. Filing a petition for review by the Administrator of this final action does not affect the finality of this action for the purposes of judicial review nor does it extend the time within which a petition for judicial review must be filed, and shall not postpone the effectiveness of such action. Thus, any petitions for review of this action related to the exemption of HFE-347pcf2 from the regulatory definition of VOC must be filed in the Court of Appeals for the District of Columbia Circuit within 60 days from the date final action is published in the *Federal Register*.

References

Atkinson, R., Baulch, D. L., Cox, R. A., Crowley, J. N., Hampson, Jr., R. F., Hynes, R. G., Jenkin, M. E., Kerr, J. A., Rossi, M. J., and Troe, J. (2006) Evaluated kinetic and photochemical data for atmospheric chemistry: Volume II – gas phase reactions of organic species. Atmos. Chem. Phys. 6: 3625-4055.

Carter, W. P. L. (1994) Development of ozone reactivity scales for volatile organic compounds. J. Air Waste Manage, 44: 881-899.

Carter, W. P. L. (2008) Reactivity Estimates for Selected Consumer Product Compounds, Final Report to California Air Resources Board Contract No. 06-408, February 19, 2008. http://www.arb.ca.gov/research/reactivity/consumer_products.pdf.

Carter, W. P. L. (2011) SAPRC Atmospheric Chemical Mechanisms and VOC Reactivity Scales, web page at http://www.engr.ucr.edu/~carter/SAPRC/ Last updated in Sept. 14, 2013. Tables of Maximum Incremental Reactivity (MIR) Values available at http://www.arb.ca.gov/regact/2009/mir2009/mir2009.htm. May 11, 2011.

Carter, W. P. L. (2014) Estimating the ground-level atmospheric ozone formation potentials of 1,1,2,2-Tetrafluoro-1-(2,2,2-trifluoroethoxy) ethane (HFE-347pcf2), November 13, 2014.

IPCC, 2007: Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K. B.

Averyt, M. Tignor and H. L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 996 pp.

IPCC, 2013: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T. F., D. Qin, G.-K. Plattner, M. Tignor, S. K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P. M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 1535 pp.

Pitts, J. N. Jr., Winer, A. M., Aschmann, S. M., Carter, W. P. L., and Atkinson, K. (1983), Experimental Protocol for Determining Hydroxyl Radical Reaction Rate Constants Environmental Science Research Laboratory, ORD, USEPA. EPA600/3-82-038.

Tokuhashi, K., Takahashi, A., Kaise, M., Kondo, K., Sekiya, A., Yamashita, S., and Ito, H., (2000), Rate Constants for the Reactions of OH Radicals with $CH_3OCF_2CHF_2$, $CHF_2OCH_2CF_2CHF_2$, $CHF_2OCH_2CF_2CF_3$, and $CF_3CH_2OCF_2CHF_2$ over the Temperature Range 250-430 K. J. Phys. Chem. Kinet A, 2000, V 104, N 6, 17 February, 2000.

UNEP (2002), Montreal Protocol on Substances that Deplete the Ozone Layer: 2002 Report of the Solvents, Coatings, and Adhesives Technical Options Committee, Assessment Report, 2002.

UNEP Technology and Economic Assessment Panel, UNEP/TEAP, (2005), Montreal Protocol on Substances that Deplete the Ozone Layer, Progress Report, May 2005.

USEPA, (USEPA/SNAP), (2004), The U.S. Solvents Cleaning Industry and the Transition to Non Ozone Depleting Substances, September 2004.

List of Subjects in 40 CFR Part 51

Environmental protection, Administrative practice and procedure, Air pollution control, Ozone, Reporting and recordkeeping requirements, Volatile organic compounds.

Dated: July 20, 2016.

Gina McCarthy,
Administrator.

For reasons stated in the preamble, part 51 of chapter I of title 40 of the Code of Federal Regulations is amended as follows:

PART 51--REQUIREMENTS FOR PREPARATION, ADOPTION, AND SUBMITTAL OF IMPLEMENTATION PLANS

Subpart F—Procedural Requirements

1. The authority citation for part 51, subpart F, continues to read as follows:

Authority: 42 U.S.C. 7401, 7411, 7412, 7413, 7414, 7470-7479, 7501-7508, 7601, and 7602.

2. Section 51.100 is amended by revising the introductory text of paragraph (s)(1) to read as follows:

§51.100 Definitions.

* * * * *

(s)(1) This includes any such organic compound other than the following, which have been determined to have negligible photochemical reactivity: methane; ethane; methylene chloride (dichloromethane); 1,1,1-trichloroethane (methyl chloroform); 1,1,2-trichloro-1,2,2-trifluoroethane (CFC-113); trichlorofluoromethane (CFC-11); dichlorodifluoromethane (CFC-12); chlorodifluoromethane (HCFC-22); trifluoromethane (HFC-23); 1,2-dichloro 1,1,2,2-tetrafluoroethane (CFC-114); chloropentafluoroethane (CFC-115); 1,1,1-trifluoro 2,2-dichloroethane (HCFC-123); 1,1,1,2-tetrafluoroethane (HFC-134a); 1,1-dichloro 1-fluoroethane (HCFC-141b); 1-chloro 1,1-difluoroethane (HCFC-142b); 2-chloro-1,1,1,2-tetrafluoroethane (HCFC-124); pentafluoroethane (HFC-125); 1,1,2,2-tetrafluoroethane (HFC-134); 1,1,1-trifluoroethane (HFC-143a); 1,1-difluoroethane (HFC-152a); parachlorobenzotrifluoride (PCBTF); cyclic, branched, or linear completely methylated siloxanes; acetone; perchloroethylene (tetrachloroethylene);

3,3-dichloro-1,1,1,2,2-pentafluoropropane (HCFC-225ca); 1,3-dichloro-1,1,2,2,3-pentafluoropropane (HCFC-225cb); 1,1,1,2,3,4,4,5,5,5-decafluoropentane (HFC 43-10mee); difluoromethane (HFC-32); ethylfluoride (HFC-161); 1,1,1,3,3,3-hexafluoropropane (HFC-236fa); 1,1,2,2,3-pentafluoropropane (HFC-245ca); 1,1,2,3,3-pentafluoropropane (HFC-245ea); 1,1,1,2,3-pentafluoropropane (HFC-245eb); 1,1,1,3,3-pentafluoropropane (HFC-245fa); 1,1,1,2,3,3-hexafluoropropane (HFC-236ea); 1,1,1,3,3-pentafluorobutane (HFC-365mfc); chlorofluoromethane (HCFC-31); 1 chloro-1-fluoroethane (HCFC-151a); 1,2-dichloro-1,1,2-trifluoroethane (HCFC-123a); 1,1,1,2,2,3,3,4,4-nonafluoro-4-methoxy-butane ($C_4F_9OCH_3$ or HFE-7100); 2-(difluoromethoxymethyl)-1,1,1,2,3,3,3-heptafluoropropane ($(CF_3)_2CFCF_2OCH_3$); 1-ethoxy-1,1,2,2,3,3,4,4,4-nonafluorobutane ($C_4F_9OC_2H_5$ or HFE-7200); 2-(ethoxydifluoromethyl)-1,1,1,2,3,3,3-heptafluoropropane ($(CF_3)_2CFCF_2OC_2H_5$); methyl acetate; 1,1,1,2,2,3,3-heptafluoro-3-methoxy-propane (n-C3F7OCH3, HFE-7000); 3-ethoxy- 1,1,1,2,3,4,4,5,5,6,6,6-dodecafluoro-2-(trifluoromethyl) hexane (HFE-7500); 1,1,1,2,3,3,3-heptafluoropropane (HFC 227ea); methyl formate (HCOOCH3); 1,1,1,2,2,3,4,5,5,5-decafluoro-3-methoxy-4-trifluoromethyl-pentane (HFE-7300); propylene carbonate; dimethyl carbonate; *trans*-1,3,3,3-tetrafluoropropene; HCF_2OCF_2H (HFE-134); $HCF_2OCF_2OCF_2H$ (HFE-236cal2); $HCF_2OCF_2CF_2OCF_2H$ (HFE-338pcc13); $HCF_2OCF_2OCF_2CF_2OCF_2H$ (H-Galden 1040x or H-Galden ZT 130 (or 150 or 180)); *trans* 1-chloro-3,3,3-trifluoroprop-1-ene; 2,3,3,3-tetrafluoropropene; 2-amino-2-methyl-1-propanol; t-butyl acetate; 1,1,2,2- Tetrafluoro -1-(2,2,2-trifluoroethoxy) ethane; and perfluorocarbon compounds which fall into these classes:

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