

**Response to EPA's Hazard Characterization of the Petroleum Hydrocarbon Gases Category**  
**The American Petroleum Institute Petroleum HPV Testing Group**  
**June 17, 2013**

The following comments are in response to EPA's Hazard Characterization (HC) for the Petroleum Hydrocarbon Gases Category (U.S. EPA, 2010). This Category was sponsored by the American Petroleum Institute (API) Petroleum HPV Testing Group (Testing Group) as part of EPA's HPV Chemical Challenge Program ([www.petroleumhpv.org](http://www.petroleumhpv.org)).

Below is EPA's generic table of content for all the HPV Hazard Characterizations they have prepared, including Petroleum Hydrocarbon Gases. The Testing Group's comments are found on the page numbers indicated below.

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## Summary

1. The EPA hazard characterization for several Petroleum HPV Categories including Petroleum Hydrocarbon Gases, refers to the category members as complex mixtures when in fact they are Class 2 UVCB substances (HC pages 6, 11).

Substances on the US TSCA Inventory are divided into two classes for ease of identification (EPA 1995). Class 1 substances are those single compounds composed of molecules with particular atoms arranged in a definite, known structure. However, many commercial substances that are subject to TSCA are not Class 1 substances, because they have unknown or variable compositions or are composed of a complex combination of different molecules. These are designated Class 2 substances. Class 2 includes substances that have no definite molecular formula representation and either partial structural diagrams or no structural diagrams. These are the "UVCB" substances (Unknown or Variable compositions, Complex reaction products and Biological materials). An example of this kind of substance is given below.

CAS Number: 68478-34-2

CAS Name: Tail gas (petroleum), vacuum residues thermal cracker

CAS Definition: A complex combination of hydrocarbons obtained from the thermal cracking of vacuum residues. It consists of hydrocarbons having carbon numbers predominantly in the range of C1 through C5.

Petroleum substances are subject to nomenclature rules developed jointly by the U.S. EPA and the American Petroleum Institute (EPA, 1995b). In that guidance document, EPA adopts the definitions of petroleum process stream terms provided in API's published reference document Petroleum Stream Terms Included in the Chemical Substance Inventory under TSCA (1983, reprinted in 1985). The Stream Terms definitions include the CAS definition and registry number, the source of the substance and process (i.e., last refining step), short name, indication of carbon number, and indication of distillation range (or other appropriate characteristic). Therefore all members of the Pet Category are UVCB substances, not mixtures, under EPA's nomenclature guidance.

2. EPA states, "The 96-h LC50 value for acute toxicity to fish for CASRN 109-66-0 is 4.26 mg/L: values for CASRNs 513-35-9 and 71-43-2 (supporting chemical) are within this range. The 48-h EC50 values for acute toxicity to aquatic invertebrates range from 2.7 mg/L (CASRN 109-66-0) to 10.5 mg/L (CASRN 287-92-3): values for CASRNs 513-35-9 and 74-85-1 (supporting chemical) are within this range. The 72-h EC50 values for aquatic plants range from 7.5 (CASRN 109-66-0) to 28 mg/L (CASRN 71-43-2, supporting chemical) for biomass and 10.7 (CASRN 109-66-0) to 72 mg/L (CASRN 74-85-1, supporting chemical) for growth rate. The 32-d NOEC chronic toxicity to fish for the supporting chemical, CASRN 71-43-2 is 0.8 mg/L."

The Testing Group points out that in Section 4, Hazard to the Environment (page 147) EPA states the following: "The C1 - C4 hydrocarbons and the hydrocarbon gases, C1 – C6 with or without 1,3-butadiene are gaseous at environmentally relevant temperatures. If released into the environment they are expected to partition largely to air and aquatic toxicity is not expected. No aquatic toxicity testing was conducted for these chemicals."

Although EPA concluded that these streams are not expected to cause toxicity to aquatic organisms due to their partitioning characteristics, EPA has assigned read-across hazard values based on pentane to cover all category members (see data matrix Table 6, pages 151-155).

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While API agrees that hazard data for pentane may be used to cover those category members containing a high proportion of C5 constituents, there are many category members that contain no or only trace amounts of C5 or greater compounds.

API supports a conclusion that recognizes physical/chemical attributes of the constituent hydrocarbons in these streams. EPA has previously used limitations of water solubility to conclude no effects at saturation for high molecular weight hydrocarbon constituents in other categories. API believes a similar argument may be made based on environmental partitioning characteristics for these petroleum gas streams. Therefore, API proposes that for category members that contain no or only trace amounts of C5 compounds, and are composed primarily of C1 - C4 hydrocarbons, aquatic toxicity is not expected, are expected to partition largely to air.

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### References cited in this response to EPA's HC for the Petroleum Hydrocarbon Gases Category

Toxic Substances Control Act Inventory Representation for Chemical Substances of Unknown or Variable Composition, Complex Reaction Products and Biological Materials: UVCB Substances (March 29, 1995a); available from <http://www.epa.gov/oppt/newchems/pubs/uvcb.txt>

Toxic Substances Control Act Inventory Representation for Certain Chemical Substances containing Varying Carbon Chain Lengths (Alkyl Ranges Using the Cx-y Notation) (March 29, 1995b); available from: <http://www.epa.gov/oppt/newchems/pubs/alkyl-rg.txt>

U.S. EPA (2010). Screening Level Hazard Characterization of High Production Volume Chemicals; Hydrocarbon Gases Category. [http://ofmpub.epa.gov/opthpv/hpv\\_hc\\_characterization.get\\_report?srtCol=last\\_update\\_date&srtDir=asc&doctype=2](http://ofmpub.epa.gov/opthpv/hpv_hc_characterization.get_report?srtCol=last_update_date&srtDir=asc&doctype=2)