PRODUCT STEWARDSHIP SUMMARY

FUELS - 2-Ethylhexyl Nitrate (2EHN)

Introduction

Afton Chemical has been supplying 2-Ethylhexyl Nitrate (2EHN), cetane improvers for over 50 years. Afton employs expert understanding of our chemistries, technologies and the fuel additive market. Our 125+ year experience has brought us to our ultimate goal which is customer intimacy using our passion for solutions. Afton is able to provide a wide array of products/technologies to meet the needs of our customers.

Uses and Advantages

2-Ethylhexyl Nitrate has been used for decades to enhance the quality of petrodiesel and biodiesel fuels by raising the cetane number. This additive may be used to improve ignition quality to give reduced noise, reduced emissions, better cold startability, and improved fuel economy. Cetane Improver is recognized as a US EPA "Verified Retrofit Technology" for NOx Reduction. In addition to reducing NOx, the use of Cetane Improver causes a reduction in other diesel pollutants such as carbon monoxide hydrocarbons and particulate matter.

Health Effects

Acute Health Effects

2EHN has undergone significant testing both internally as well as through the United States Environmental Protection High Production Volume (HPV) program to determine the health and environmental effects. 2EHN has a low acute oral and dermal toxicity when tested in animals. However, ingestion, dermal absorption, or inhalation of 2EHN can result in enlargement of the blood vessels causing reduced blood pressure, known as vasodilation. Therefore, 2EHN is classified as "Harmful if swallowed, in contact with the skin, or inhaled." 2EHN is not considered a skin or eye irritant nor is it considered a skin sensitizer. Based on the available data, 2EHN is not expected to cause reproductive, developmental, mutagenic, or carcinogenic effects.

Environmental Effects

2EHN has been studied in vertebrate and invertebrate species, where some toxicity was seen. 2EHN is expected to partition into the soil and has a low to moderate potential to bioaccumulate. The substance is classified as Toxic to aquatic life with long lasting effects.

Exposure

The exposure guideline for 2EHN set by suppliers and manufacturers is 1ppm based on an 8-hour time weighted average. In light of the potential temporary effects of overexposure, it is suggested that appropriate Personal Protective Equipment (PPE) be used as reference standard for short-term exposure limits averaged over 15 minutes.

The appropriate PPE for 2EHN is:

- **Level 1**– Minimal Potential for Overexposure: requires the basic PPE to be used.
- **Level 2**– Moderate Potential for Overexposure: requires the use of chemical goggles, gloves and boots made of nitrile or butyl rubber, coverall disposable Tyvek suit, a face shield and an organic vapor cartridge respirator.
- **Level 3**– High Potential for overexposure: requires a self-contained breathing apparatus, glove and boots made of nitrile or butyl rubber, and an impervious suit made of nitrile or butyl rubber secured with tape at the wrists

Information in the Safety and Handling Manual and on the Safety Data Sheet (SDS) should be followed in the event of a spill.

Risk Management

Afton offers 2–Ethylhexyl nitrate (2EHN), as a performance additive used to raise the Cetane number of diesel fuels. This additive chemically alters the combustion process in a diesel engine, provides fuel benefits and refiners with an economical way to optimize the output of a refinery.

2EHN is combustible in both liquid and vapor forms. It undergoes a self-accelerating decomposition reaction if heated above 100C (2 12F). For this reason, Cetane improver requires special care in handling due to health effects and the thermodynamic properties of the material. The following are available from your Afton representative: Material Safety Data Sheet, Safety & Handling Manual for 2-Ethylhexyl Nitrate (2EHN) and Blended Products Containing 2EHN. Afton provides assistance with equipment design and on-site assistance in startup.

Conclusion

In conclusion, the use of 2EHN allows upgrading diesel to support marketing claims and optimization of refinery economics. Afton strives to supply the best Cetane improver, providing the technical expertise for obtaining the greatest value from the use of 2EHN. Afton is committed to providing its customers with the information they need to responsibly manage any health and environmental risks associated with the intended use of Afton products.

For additional information, contact us at:

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