

PRODUCT STEWARDSHIP SUMMARY

Calcium Phenates**Introduction**

Afton aims to deliver technologies that allow our customers to achieve a competitive, cost-effective finished fluid formulation. These solutions are formulated products comprising several additive chemicals, each delivering one or more performance attributes. A major component of lubricant additives is detergents. Calcium phenates are detergents which help control deposit formation, reduce oil degradation and reduce wear. Calcium phenates are largely colloidal materials, where an alkylphenate surfactant stabilizes a calcium carbonate core within the hydrocarbon lubricant fluid. Effective use of these additives enables efficient equipment operation under increased operational stress, longer application life, reduced emissions and improved fuel economy.

Uses and Advantages

Calcium phenates are used as part of an overall formulation solution to impart specific performance attributes to a lubricant. Areas of application include passenger car motor oils, heavy duty diesel engine oils, motorcycle oils, transmission and gear oils, and industrial applications.

Advantages of using detergents include the following:

- Neutralization of acids, produced as by-products of combustion processes, reducing equipment corrosion
- Oxidation control, extending the useful life of lubricants
- Improved wear and extreme pressure protection, reducing damage and extending equipment lifetime
- Friction management, ensuring effective equipment operation and emissions reduction
- Deposit and contamination reduction, extending useful lubricant life, and maintaining equipment operation
- Prevention of sludge build-up, extending useful lubricant life and equipment operation

Health Effects

Calcium phenates are generally of low concern for acute oral, dermal, and inhalation toxicity. They are not expected to be irritating to the skin and eyes, to cause skin sensitization, or to cause mutagenic effects. Exposure to high levels of calcium phenates over extended time periods may cause reproductive effects and endocrine disruption due to the residual amounts of tetrapropenylphenol (TPP) from the manufacturing process. Afton has worked to reduce levels of residual TPP over the last several years and continues to invest in research to further reduce calcium phenate and TPP levels in finished products. Exposure to calcium phenates may also be harmful after exposure to high doses, with the primary effects occurring to the kidney. This is due to the residual levels of ethylene glycol.

Environmental Effects

Calcium phenates may cause long-lasting harmful effects to aquatic life due to the residual presence of TPP. Calcium phenates are not readily biodegradable. However, they are not bioaccumulative and therefore are not considered PBT (Persistent, Bioaccumulative, and Toxic) or vPvB (very Persistent very Bioaccumulative).

Exposure

For industrial workers, the most common route of exposure is via skin contact during manufacturing and processing. The extent of exposure can depend on the type of manufacturing system (open or enclosed), adequacy of engineering controls, material handling practices, and use of personal protective equipment. Handling at elevated temperatures or generating vapors and/or mists can increase inhalation exposure which is otherwise not considered a significant route of exposure.

For professional and consumer use, the primary route of exposure is via skin contact with finished lubricants and engine oils. This can occur during fluid changes or when adding lubricants to vehicles. Inhalation is not generally a concern for professional and consumer use. Exposure to calcium phenates is less in the finished lubricant due to its reduced concentration. Many lubricants and engine oils are either not classified as hazardous according to the Globally Harmonized System of Classification and Labeling of Chemicals (GHS) or have relatively low hazard classifications.

Risk Management

Engine oils and lubricants containing calcium phenates are formulated to meet a wide range of performance requirements. The health and environmental risks of these products can vary depending on the product as well as the conditions encountered during their use. Information on the safe handling of these products is provided to users through the safety data sheets. Appropriate engineering, administrative controls (work practices), and personal protective equipment are recommended to control exposures during manufacture and use.

Conclusion

Calcium phenates deliver critical performance across many applications, including passenger car motor oils, heavy duty diesel motor oil, motorcycle oils, transmission and gear oils, and industrial applications. Afton is committed to providing its customers with the information they need to responsibly manage any safety, health, and environmental risks associated with the intended use of Afton products.

For additional information, contact us at:

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