

# MINERAL OIL HYDROCARBONS (MOSH, MOAH)

MOSH and MOAH refer to **Mineral Oil Saturated Hydrocarbons** and **Mineral Oil Aromatic Hydrocarbons**. Essentially, these mineral oils are mixtures of hydrocarbons containing thousands of chemical compounds of various sizes and structural configurations, mainly derived from crude oil. These are also derived from the liquefaction of coal, natural gas and biomass. MOSH are paraffin-like, open-chained, commonly branched hydrocarbons (e.g., alkanes) and naphthene-like cyclic hydrocarbons (cycloalkanes). Whereas MOAH are hydrocarbons primarily consisting of highly alkylated mono- and/or poly-aromatic rings. These compounds can be found everywhere in the environment.

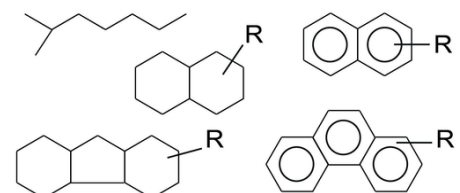
According to the current state of scientific knowledge, there is no sufficient toxicological evidence to prove a health risk to humans from saturated mineral oil fractions (MOSH). Meanwhile, MOAH is suspected to be carcinogenic (especially PAH-like compounds with 3-7 ring systems); therefore, their levels in food should be reduced according to the ALARA principle. (as low as reasonably achievable). Currently, there are neither specific legal regulations nor maximum levels for mineral oil components in food.

## MOSH AND MOAH FIND APPLICATIONS IN MANY AREAS, INCLUDING:

- ▶ **Fatty components in cosmetic products**
- ▶ **Food contact materials, packaging (recycled paperboard, baking cups, paper, or plastic bags)**
- ▶ **Transport packaging materials (cardboard packages, hotmelt cardboard)**
- ▶ **Printing colours in packaging**
- ▶ **Lubricating oils, surface treatment agents**
- ▶ **Food oils like sunflower oil, vegetable oils and other edible oils and fats**
- ▶ **Other food items like rice, pasta, cereal products, deep-frozen foods, bakery products and many other processed products**

## AS A POTENTIAL HAZARD

These mineral oil hydrocarbons, especially MOSH and MOAH, can migrate into foods during production and transportation and act as contaminants. The risk of contamination may be due to



- ▶ **Properties of foods**
- ▶ **Concentration of MOSH/MOAH in the source**
- ▶ **Type, quantity and duration of the contact**
- ▶ **Temperature**

Generally, these compounds are not present in the raw ingredient and hence it is noted that they get into food during the production stages such as raw material procurement, storage, transportation, processing and finally packaging materials.

## SOURCES OF CONTAMINATION

Adhesives, printer inks, recycled packaging materials, hydraulic oils, lubricant oils, release agents, exhaust gases from the environment and industrial plants, food additives like coating agents, anti-dusting agents, etc.

## REGULATION

As per the current state of scientific knowledge, MOAH is suspected to be carcinogenic. Due to this, their levels in food should be reduced as low as reasonably achievable. National governments, specifically ministries of food and agriculture, are stressing the EC to recommend maximum allowable concentrations of MOSH and MOAH in food and food packaging materials. The common food groups for mineral oil contamination mainly include rice, cereals, chocolate products, spices, fats and oils, as well as further processed and packed foods.

In 2017, the European Commission (EC) adopted the recommendation EU 2017/84 for regulating Mineral Oil Hydrocarbons (MOHs) in food and food contact materials. Food contact materials are all materials that possibly come into contact with food, including packaging and containers. These can be made from plastics, paper, rubber, and metals. The EC requested that the Member States, manufacturers, processors, and distributors of food contact materials monitor the presence of Mineral Oil Hydrocarbons in food during 2017 and 2018.

The monitoring covers animal fat, bread and rolls, biscuits and cakes, breakfast cereals, confectionary, including chocolate and cocoa, fish meat and products, ices and desserts, oilseeds, pasta, and many more.

In 2009, the German Federal Institute for Risk Assessment (BfR) issued a warning regarding the direct contact of large surface dry foods with recycled cardboard. Food packaging is subject to EU Regulation 1935/2004 and may not be harmful to consumer health. The BfR suggested the following indicative values for mineral oils in food: • C10-16: 12 mg/kg food • C17-20: 4 mg/kg food. According to the Draft German National Mineral Oil Regulation, packaging from recycling materials is only marketable if the migration of MOAH (C16-C35) does not exceed 0.5 mg/kg food.



## WHY US

**Eureka** fulfils the need for reliability and traceability in the analysis of Mineral Oil Hydrocarbons. Mineral oil hydrocarbon authentication helps manufacturers, suppliers and retailers appropriately specify the manufacture of products, chemical management, risk assessment, and testing to complete MOAH and MOSH certification of products.

As always, Eureka is here to support you not only with our sampling, testing and inspection services but also with expert advice on related topics.