Product Safety Assessment

**ADSORBSIA™ Adsorbent Media**

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**Names**

- CAS No. 13463-67-7
- ADSORBSIA™ As600 media
- Titanium dioxide

**Product Overview**

- ADSORBSIA™ adsorbent media are odorless, off-white titanium dioxide (TiO₂) products with high surface areas and a strong affinity for arsenic, lead, and other heavy metals. ADSORBSIA As600 ¹,² media is supplied as granules. For further details, see Product Description.
- ADSORBSIA adsorbent media are used in public and private water-treatment systems to reduce arsenic levels for compliance with applicable governmental standards.¹ For further details, see Product Uses.
- These products are not sold for direct consumer use. However, the products may be sealed by equipment manufacturers into cartridges that are designed for home use. Consumer exposure is unlikely. For further details, see Exposure Potential.
- Dust from these products may be irritating to the eyes due to mechanical action and may cause irritation to the upper respiratory tract. They are slight to moderate irritating to the skin. If swallowed, these products have very low toxicity.² In 2006, the International Agency for Research on Cancer (IARC) classified titanium dioxide as “possibly carcinogenic to humans” based on evidence that high concentrations of ultra-fine titanium dioxide dust caused respiratory tract cancer in inhalation studies with laboratory animals.³ No human studies have suggested an association between titanium dioxide and increased risk for cancer.³ A thorough training program and appropriate work processes and safety equipment should be in place to limit unnecessary exposure. For further details, see Exposure Potential, Health Information or Physical Hazard Information.
- ADSORBSIA™ adsorbent media are stable and do not burn. Contact with strong acids should be avoided.² For further details, see Physical Hazard Information.

**Manufacture of Product**

The product is produced for Dow by Graver Technologies, Glasgow, DE USA. ADSORBSIA™ is microcrystalline TiO₂ agglomerated into a granule using a polymer binder.

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Product Description

ADSORBSIA™ adsorbent media are odorless, off-white nanocrystalline titanium dioxide (TiO₂) products with high surface areas and a strong affinity for arsenic, lead, and other heavy metals. ADSORBSIA As600 media is a granular product in which a slightly different chemical treatment process is used. These products are typically about 89% titanium dioxide, with the balance being water and a polymer binder.

ADSORBSIA adsorbent media meet the NSF/American National Standards Institute (ANSI) Standard 61 for Drinking Water System Components. They are certified for water treatment plant applications. ADSORBSIA adsorbent media require pretreatment prior to use as outlined in the Loading and Start Up Procedures. The lifetime for effective removal of arsenic, lead, and other heavy metals depends upon use conditions. ADSORBSIA adsorbent media cannot be regenerated once their capacity is exceeded. For more information, Contact Us.

Product Uses

Titanium dioxide is widely used as a bright white, opaque pigment in paints, paper and paperboard, food products, and plastics.

However, ADSORBSIA™ adsorbent media are used exclusively to remove naturally occurring heavy-metal contaminants, especially arsenic and lead, from drinking water in smaller public water-treatment systems, allowing them to comply with U.S. Environmental Protection Agency (EPA) and other applicable government regulations and standards.

Exposure Potential

Based on the uses of ADSORBSIA™ adsorbent media, the public could be exposed through:

- **Workplace exposure** – Exposure can occur either in a manufacturing facility or in the various water-treatment facilities that use this product. Those working in manufacturing operations could be exposed during maintenance, sampling, testing, or other procedures. Each manufacturing facility and water-treatment facility should have a thorough training program for employees and appropriate work processes and safety equipment in place to limit unnecessary exposure. See Health Information.

- **Consumer exposure to products containing ADSORBSIA adsorbent media** – This product is not sold for direct consumer use. However, the product may be sealed by equipment manufacturers into cartridges that are designed for home use. Consumer exposure is unlikely. See Health Information.

- **Environmental releases** – In the event of a spill, the focus is on containing the spill to prevent contamination of soil and surface or ground water. For small spills, the product can be swept up and collected in suitable and properly labeled containers. An approved dust respirator is recommended for cleaning up spills. This material is considered practically nontoxic to aquatic organisms. See Environmental, Health, and Physical Hazard Information.

- **Large release** – Industrial spills or releases are infrequent and generally contained. If a large spill does occur, the material should be captured, collected, and reprocessed or disposed of according to applicable governmental requirements. An approved dust respirator is recommended for emergency work. Spilled material may represent a slipping hazard. See Environmental, Health, and Physical Hazard Information.
In case of fire – Deny any unnecessary entry into the area and consider the use of unmanned hose holders. These products do not burn, so fight the fire in accordance with the material that is burning. Avoid creating airborne dusts. Follow emergency procedures carefully.

For more information, see the relevant Safety Data Sheet.

Health Information

Dust from ADSORBIA™ adsorbent media may be irritating to the eyes due to mechanical action and may cause irritation to the upper respiratory tract. The products are essentially slight to moderate irritating to the skin, although they may cause drying and flaking of the skin. If swallowed, these products have very low toxicity. No harmful effects are anticipated from swallowing small amounts.

In 2006, the International Agency for Research on Cancer (IARC) classified titanium dioxide as a Group 2 carcinogen “possibly carcinogenic to humans” via inhalation. This was based on evidence that showed that high concentrations of ultra-fine titanium dioxide dust caused respiratory tract cancer in inhalation studies with laboratory animals. No human studies have suggested an association between titanium dioxide and increased risk for cancer.

For more information, see the relevant Safety Data Sheet.

Environmental Information

The bioconcentration potential (tendency to accumulate in the food chain) for the components of ADSORBIA™ adsorbent media is low and potential for mobility in soil is high. These products are practically nontoxic to aquatic organisms on an acute basis.

For more information, see the relevant Safety Data Sheet.

Physical Hazard Information

ADSORBSIA™ adsorbent media are stable and do not burn. Contact with strong acids should be avoided.

For more information, see the relevant Safety Data Sheet.

Regulatory Information

Spent ADSORBIA™ media from arsenic loading tests have been shown to pass U.S. TCLP (Toxicity characteristic leaching procedure) and California WET (waste extraction test) and STCL (Solute threshold concentration limits).

Regulations may exist that govern the manufacture, sale, transportation, use, and/or disposal of ADSORBIA adsorbent media. These regulations may vary by city, state, country, or geographic region. The user is responsible for compliance with applicable regulations. Information may be found by consulting the relevant Safety Data Sheet, Product Information Sheet, or Contact Us.
Additional Information

- Safety Data Sheet (http://www.dow.com/assistance/dowcig.htm)
- Contact Us (http://www.dowwaterandprocess.com/en/contact)
- Dow Answer center for: disinfection, pre-treatment, hardness of to be treated water, impact of competing ions/impurities, projected useful life, regenerability, factors affecting the arsenic capacity, arsenic III removal, backwash, packaging size. (http://www.dowwaterandprocess.com/en/search-results?q=adsorbsia)


References

2. *ADSORBSIA™ As600™ Titanium Based Adsorbent Material Safety Data Sheet*, The Dow Chemical Company

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