

WATER-BASED APPLICATIONS OF PRISTINA™ AEROGEL ADSORBENTS AND CATALYSTS

Application Field	Environmental Control	Process Industries
Objectives	Selective Adsorption for Removal of pollutants; or Catalytic Conversion of pollutants to benign compounds	Selective Adsorption for Recovery of primary products; or Catalytic Conversion for manufacturing of primary products
Dissolved Organics	Developed* Applications: <ol style="list-style-type: none"> 1. Destruction of Cyanide by Photocatalytic Conversion to N₂ & CO₂. 2. Destruction of Benzene by Photocatalytic Conversion to CO₂ & H₂O. 3. Above technologies apply to a wide range of Organics, including toxic chemicals 	Developed* Applications: <ol style="list-style-type: none"> 1. Selective Adsorption recovery of primary alcohol from fermentation precursors. 2. Production of formic acid by Photocatalytic Conversion of CO₂
Dissolved Metals	Selective Adsorption or Photocatalytic Reduction for the removal or precipitation of dissolved heavy metals, (Fe, Cr, Cd, Hg, Cu, Zn, Ni, etc.)	Selective Adsorption or Photocatalytic Reduction for the Recovery of valuable metals from water or leach liquors, (Au, Ag, Cu, Pt, etc.)

* At different stages of development.

Why Pristina™ Aerogel Photocatalysts:

TAASI Aerogel Photocatalysts versus Current practice: Traditional methods for detoxification of cyanides rely on chemical treatment by chlorine (Cl₂) gas, or SO₂ gas. Disadvantages of these processes include high cost of gas chemicals, corrosion, health and environmental hazards from escaping gases or their reaction products.

TAASI Pristina™ Aerogel Photocatalysts are more cost effective without any of the corrosion, health or environmental hazards.

TAASI Aerogel Photocatalysts versus Non-Aerogel Photocatalysts: To obtain high specific surface area, the non-aerogel (e.g., Anatase) has to be made into extremely fine particles, which are very difficult to recover for reuse, and further result in contamination of water with these particulates.

TAASI Pristina™ Aerogel Photocatalysts provide high surface area for reactions at large sizes for easy handling and reuse.

Pristina™ Aerogel Photocatalysts are designed to be more efficient in light energy utilization for the chemical conversions.

Market Potentials: Cyanide Destruction These include among others, Mining & Metallurgy of precious metals; Textiles; Coke Chemicals; and Foods. **Benzene Destruction:** Include contaminated water from Petroleum Production & Refineries; Removal from condensation water in Natural Gas distribution stations.