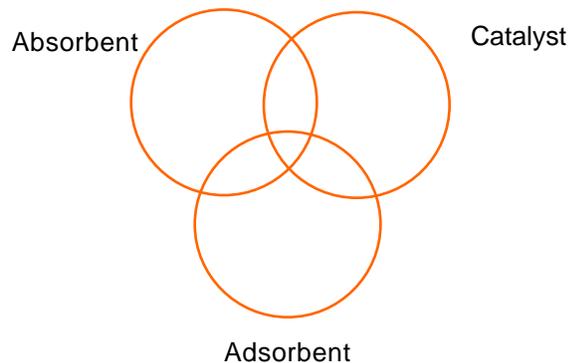


# PRISTINA™ AEROGEL FOR AIR PURIFICATION



Pristina Aerogel products are capable of selective and efficient removal of many pollutants / contaminants from air for either the safe emission control, or their recycle and reuse. Examples of gases and vapors of volatile organic compounds (**VOC**) adsorbed and /or catalytically converted by Pristina Aerogels are shown in the [Performance Data section](#).

Because of their versatile structures, Pristina Aerogels offer a range of application options for air purification, as shown in the following two types of applications.

## **Simultaneous SO<sub>2</sub>/ NO<sub>x</sub> Removal:**

- Throw- away process for SO<sub>2</sub>
- Catalytic reduction of NO<sub>x</sub>
- Regenerative process for SO<sub>2</sub> with sales of SO<sub>2</sub> or sulfur
- Combined regenerative SO<sub>2</sub>- NO<sub>x</sub> process.

## **Pristina Aerogel in VOC Control:**

- Throw- away adsorption processes
- Regenerative adsorption process with sales or reuse of organics
- Catalytic conversion to benign compounds.

## **A Case Study: VOC Emission Control and Solvent Recovery:**

Independent side by side testing of TAASI's **Pristina™ Aerogels** and carbons, and TAASI's own testing revealed the following:

- **Pristina™ Aerogels are highly competitive VOC adsorbents** compared with high capacity activated carbons for non-polar solvents such as toluene and benzene, and are superior performers for adsorption of other types of VOC such as formaldehyde, acetone, and methylene chloride. In addition, they can also adsorb other gases such as SO<sub>2</sub>, NO<sub>x</sub>, and H<sub>2</sub>S. Some of the aerogel products have dual adsorption and catalysis functionality as well.
- **Aerogels have 25% faster desorption kinetics** than carbons. Faster desorption of adsorbed VOC leads to reduced operating cost of the emission control-solvent recovery unit.
- **Adsorption of VOC is not adversely affected by prior steam adsorption** on aerogel. This is significant, since the presence of moisture interferes with VOC adsorption by activated carbon. This means that heating the VOC-laden air to dry the moisture is not necessary for efficient adsorption by **Pristina™ aerogels**, thus leading to lower operating costs.
- **Inorganic Pristina™ Aerogels (metal oxides) are not combustible or oxidizable** when exposed to oxygen or oxygenated VOC's which may react with activated carbon and thus destroy or burn it. Thus **Pristina™ Aerogels** are expected to have longer working life than activated carbon.
- **Desorption of VOC by warm air (50 °C) is possible with inorganic Pristina™ Aerogels**, instead of expensive steam or inert gases as is the case with traditional activated carbon systems. In this case, a condenser and/or a cryogenic unit would be used to separate the solvent from the desorbing air stream. Use of steam can lead to complicated separation of recovered solvent from condensed steam water; pollution of water which may require further complex processing before reuse or disposal; possible chemical alteration of recovered solvent; and production of organic acids which could corrode the recovery unit's equipment.