



## Inventors

### **Dr. Kiril D. Hristovski**

Assistant Professor  
Environmental Technology  
and Emergency Management  
Department of Applied  
Sciences and Mathematics  
College of Technology and  
Innovation  
Arizona State University -  
Polytechnic Campus

### **Dr. Paul Westerhoff**

Professor  
Civil, Environmental, and  
Sustainable Engineering  
Arizona State University

## Intellectual Property

### **Status:**

Patent Pending

## Contact

### **Bill Loux**

Director of Business Development  
Arizona Technology  
Enterprises, LLC (AzTE)

480.884.1996 main

480.884.1992 desk

Email: bloux@azte.com

## Titanium Dioxide Based Hybrid Ion-Exchange Media For Simultaneous Removal of Strong Acid Anions and Oxo-Anions

AzTE Case # M11-116

### **Background**

Water purification and water treatment processes influence the quality of everyday life. While there have been many recent advanced developments in water purification and treatment, they are expensive and not applicable on a large scale. There is a strong need in industry for improved water purification and treatment processes for drinking water as well as wastewater in general that remove a variety of contaminants.

### **Invention Description**

Researchers at Arizona State University have developed an exciting ion-exchange media that simultaneously removes strong acids and oxo-anions from water. This media uses titanium dioxide to remove contaminants which is advantageous over the current media of iron hydroxides. Titanium dioxide is more stable and resistant to dissolution in natural waters. The fabrication process uses easy and inexpensive approaches suitable for production of large quantities of the media using very simple manufacturing processes.

### **Potential Applications**

Water Treatment for:

- Purified Drinking Water
- Industry Cooling Towers
- Agriculture

### **Benefits and Advantages**

**Stability:** Titanium dioxide is more stable than existing iron hydroxides used in fabricating similar media.

**Simultaneous:** Both strong acids and oxo-anions are removed using the same media.

**Inexpensive:** The high cost of fabrication for titanium dioxide limits the use of titanium dioxide as a media. This invention has developed an inexpensive method to synthesize the titanium dioxide.

**Simple:** The manufacturing process is easy to develop and can produce large quantities.