

## **Ken-ichi Katsumata, Ph.D.**

Associate Professor

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Date of Birth: 14<sup>th</sup> November 1977 (aged 42 years)

Nationality/Sex/Marital Status: Japan/Male/Married



### **EXPERIENCE**

**Tokyo University of Science, Chiba, Japan**

*Associate Professor*, 2019-Present

Preparation and characterization of photo-functional materials (photocatalyst, water splitting, artificial photosynthesis) with glass

Development of novel process for environmental purification materials

**Tokyo University of Science, Chiba, Japan**

*Associate Professor*, 2015-2019

Preparation and characterization of photo-functional materials (photocatalyst, water splitting, artificial photosynthesis) with specific nanostructures (nanosheet, nanotube)

Development of novel process for environmental purification materials

**Tokyo Institute of Technology, Yokohama, Japan**

*Lecturer*, 2014-2015

Preparation and characterization of photo-functional materials (photocatalyst, water splitting, artificial photosynthesis) with specific nanostructures (nanosheet, nanotube)

**Tokyo Institute of Technology, Yokohama, Japan**

*Assistant Professor*, 2009-2014

Preparation and characterization of photo-functional materials (photocatalyst, water splitting, artificial photosynthesis) with specific nanostructures (nanosheet, nanotube)

**Central Japan Railway Company, Aichi, Japan**

*Research Engineer*, 2006-2009

Development of photocatalytic glass (self-cleaning glass) for vehicles with nano-sheet coating

## **EDUCATION**

**Tokyo Institute of Technology**, Tokyo, Japan

*Doctor of Engineering*, March, 2006

Doctor thesis: Photoinduced hydrophilicity and roughness variation of the microstructural controlled polycrystalline TiO<sub>2</sub> thin films

**Tokyo Institute of Technology**, Tokyo, Japan

*Master of Engineering*, March, 2003

Master thesis: Humidity sensitivity of porous TiO<sub>2</sub> prepared by phase separation-selective leaching and sputtering method

**Tokyo Institute of Technology**, Tokyo, Japan

*Bachelor of Inorganic Materials*, March, 2002

Bachelor thesis: Effect of Ge ion addition on phase stability of anatase and photocatalytic activity

## **RESEARCH BACKGROUND, STRENGTH, PROFESSIONAL STATUS**

### **Research Background**

Ken-ichi Katsumata was born in Fukushima, Japan, in 1977. He received Ph. D. degree at Tokyo Institute of Technology (Ph.D. Supervisor: Prof. Akira Nakajima) in 2006. From 2006 to 2009, he worked in functional materials team (Director: Prof. Akira Fujishima) at Central Japan Railway Company as a researcher. Then, he worked at Materials and Structures Laboratory, Tokyo Institute of Technology as assistant professor (2009-2014) and lecturer (2014-2015), where he studied about synthesis of photocatalytic materials with specific nanostructures (nanosheet, nanotube, nanocrystal, etc.) (with Prof. Kiyoshi Okada, Prof. Nobuhiro Matsushita). Then, he worked at Photocatalysis International Research Center, Tokyo University of Science as an associate professor (2015-2019), where he studies about the practical application and commercialization of photocatalysts (Director: Prof. Akira Fujishima). Now, he is an associate professor at Department of Materials Science and Technology, Tokyo University of Science, and he interests in preparation of environmental purification materials with glass.

### **Strength and Professional Status**

Preparation of novel structure by solution process

Development of novel process to control particle morphology

Photocatalysis (environmental purification, self-cleaning, artificial photosynthesis)

## **MAIN RESEARCH ACHIEVEMENTS**

Dr. Ken-ichi Katsumata has been studying at the research institute of the company and the research institute of the university, and he has reached the idea of this research and has mainly conducted

research on environmental purification and energy generation. The company's laboratory is working on the development of a photocatalytic glass for shinkansen window glass by using a nanosheet with high aspect ratio and smooth surface peculiar to a sheet-like structure, very excellent adhesion, film hardness, initial antifouling. He has succeeded in developing nanosheet photocatalytic glass with self-cleaning function. (*J. Am. Chem. Soc.*, *ACS Appl. Mater. Interfaces*) After transferring to university, he was working on research on particle shape control by solution process, and he succeeded the first time in the world for synthesizing titanium oxide pseudo-cubic shape brookite crystal with amphiphilic and highly active photocatalytic function by solvothermal method (*Cryst. Growth Des.*, *ACS Appl. Mater. Interfaces*). Further, he developed a solution process to synthesize tubular or sheet-shaped tungsten oxides and synthesized highly active photocatalyst under visible light. (*J. Hazard. Mater.*) Based on these properties derived from the nanosheet structure and experience of form control method by solution process, he had the idea of nanosheet synthesis using ionic liquid of this research (*ACS Appl. Nano Mater.*). In recent years, studies on artificial photosynthesis using clay minerals which are common on the earth (*Mater. Lett.*, *Appl. Catal. B*) and iron rust containing iron as the main component (ubiquitous element) research activities for this research as it is working as a research representative in the development of materials combining water environment purification with energy generation (*Chem. Eur. J.*).