



Kazuaki YAMAGIWA, Dr. Eng.

Professor

Program: Advanced Materials Science and Technology

Area: Applied Chemistry and Chemical Engineering

Professional Expertise

My professional expertise falls in the fields of environmental chemical engineering, biochemical engineering, and separation engineering. It contains the following topics: wastewater treatment technologies such as activated sludge, biofilm, constructed wetland, sludge minimization, methane fermentation; micro-gas-liquid contactor to dissolve ozone into water in high concentration; adsorptive separation using temperature-sensitive gel. Experimental works with bench-scale reactors have mainly been conducted.

Research Fields of Interest

Wastewater treatment.

- Fluidized biological activated carbon treatment
- Membrane-attached biofilm for simultaneous nitrification and carbon removal
- Engineered construction wetland for aerobic and anaerobic treatment of less-biodegradable organic pollutants
- Minimization of excess sludge production through prey-predator food chain, aerobic digestion through membrane-aeration, or aerobic digestion by protease-producing bacteria
- Sludge recycle through methane fermentation or production of biopesticide

Combustion technology.

- Combustion of emulsified waste oil with less emissions of CO and NO_x

Temperature-Swing Adsorption.

- Preparation of temperature-sensitive polymeric gel via photo-polymerization
- Temperature-swing adsorption of hydrophobic organic matter

Micro-reactor .

- Development of micro gas-liquid contactor in which gas and liquid are countercurrently contacted.
- Production of ozonated water

Education

1987: D. Eng., Interdisciplinary Graduate School of Science and Engineering, Department of Environmental Chemistry and Engineering, Tokyo Institute of University

1981: Master Eng., Graduate School of Engineering, Course of Chemical Engineering, Niigata University

1979: Bachelor Eng., Department of Chemical Engineering, Niigata University

Professional Societies and Activities

1. Delegate and member of the Society of Chemical Engineers, Japan (SCEJ)
2. Member of International Water Association (IWA)
3. Member of Japanese Society for Engineering Education (JSEE)
4. Member of Japan Society on Water Environment (JSWE)

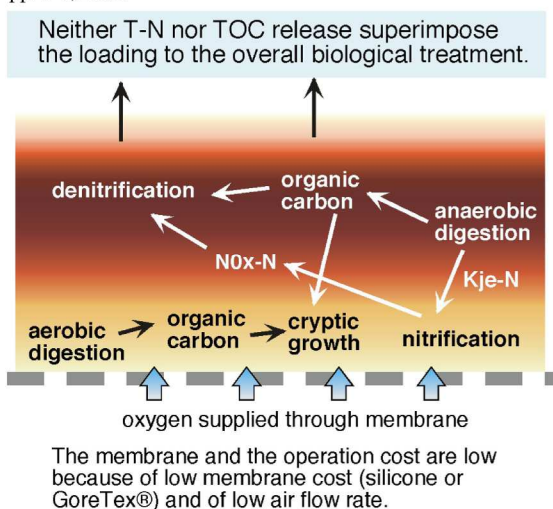
5. Member of Society of Environmental Science, Japan (SES)
6. Professional Engineering Educator certificated by JSEE

Awards

Kazuaki Yamagiwa, "Performance Characteristics of a Stirred-Tank Reactor with a Mechanical Foam-Breaker Utilizing Shear Force", *Outstanding Paper Award of 2004 J. Chem. Eng. Japan*, JCEJ, 37 (12), 1488-1496 (2004), The Society of Chemical Engineering, Japan, 2004.

Major Publications Papers

- [1] J. Sotodate, K. Inaba, H. Tajima, K. Yamagiwa, "Effect of ultrasonication on excess sludge bioavailability for methane production," *J. Chem. Eng. Japan*, **42** (online special issue), pp. s67-72, 2009.
- [2] K. Yamagiwa, R. Kojima, M. Nishizawa, S. Ishizuka, H. Tajima, "Aerobic digestion of sedimented activated sludge by membrane aeration (in Japanese)," *Johkasou Kenkyu*, **21** (1), pp. 1-7, 2009.



- [3] S.-A. Ong, K. Uchiyama, D. Inadama, K. Yamagiwa, "Simultaneous removal of color, organic compounds and nutrients in azo dye-containing wastewater using up-flow constructed wetland," *J. Hazardous Materials*, **165** (1), pp. 696-703, 2009.
- [4] S.-A. Ong, K. Uchiyama, D. Inadama, Y. Ishida, K. Yamagiwa, "Phytoremediation of industrial effluent containing azo dye by model up-flow constructed wetlands," *Chinese Chem. Lett.*, **20**, pp. 225-228, 2009.
- [5] C.-Y. Wu, S. Ushiwaka, H. Horii, K. Yamagiwa, "Membrane-attached biofilm as a mean to facilitate nitrification in activated sludge process and its effect on the microfaunal population," *Biochem. Eng. J.*, **40**, pp. 430-436, 2008.
- [6] K. Yamagiwa, T. Yamashita, T. Kamimura, T. Shimizu, A. Ohkawa, "Recovery of hexavalent chromium ion from



collecting emergent plants for construction wetland

- methanol with ion exchange resin," *J. Chem. Eng. Japan*, **40** (5), pp. 447-453, 2007.
- [7] C.-Y. Wu, D. Ushiwaka, H. Horii, K. Yamagiwa, "Boosting nitrification by membrane-attached biofilm," *Water Sci. Technol.*, **54** (9), pp. 121-128, 2006.
- [8] K. Yamagwia, T. Kobaysashi, Y. Taguchi, M. Yoshida, A. Ohkawa, "Selection of alginate and gelling conditions for immobilization of α -galactosidase," *Trends in Chem. Eng.*, **8**, pp. 61-73, 2004.
- [9] K. Yamagiwa, M. Abe, M. Shibai, M. Yoshida, A. Ohkawa, M. Furusawa, "Nitrification performance of membrane-attached nitrifying biofilm," *J. Chem. Eng. Japan*, **34** (11), pp. 1423-1426, 2004.

Proceedings

- [1] T. Sakatsume, N. Nagumo, H. Tajima, K. Yamagiwa, "Effect of microwave pretreatment of excess sludge on solid-fermentation of biopesticide-producing bacteria," 20th Int. Symp. Chem. React. Eng., pp. 572-573 (PA22), Kyoto, Japan, 2008.
- [2] K. Yamagiwa, S. Yokoyama, Y. Fukuda, H. Tajima, "Removal and recovery of hydrophobic contaminants by temperature-swing adsorption," 12th Asian Pacific Confederation of Chemical Engineering Congress, 2, pp. 286-287, Dalian, China, 2008.
- [3] R. Masui, H. Tajima, K. Yamagiwa, "Effects of water content on heat efficiency and NOx emission in water fuel emulsion combustion," 12th Asian Pacific Confederation of Chemical Engineering Congress, 1, pp. 262-263, Dalian, China, 2008.
- [4] K. Takaku, K. Yamagiwa, A. Ito, "A 7.5 hours compact project-based learning in chemical engineering course," Int. Symp. Fusion Tech 2006-2007 at Niigata, A4-3, Niigata, Japan, 2007
- [5] B. Phengpasirth, S. Matsuzaki, K. Yamagwia, A. Ohakwa, "Simultaneous organic carbon removal and nitrificatin rates of membrane-attached biofilm," 1st IWA-ASPIRE (Asia Pacific Regional Group) Conf. and Exh., 8A-5, Singapore, Singapore, 2005.