

Miray Bekbölet**Program Area :** Environmental Sciences**Address :** Bogazici University, Institute of Environmental Sciences, 34342, Bebek, Istanbul, Turkey**E-mail :** bekbolet@boun.edu.tr**Telephone :** (212) 359-7012**Professional Registration :** Prof.**Alternate URL for this homepage : -****Areas of Interest :**

- Advanced oxidation techniques, photocatalytic and photolytic reactions, ozonation, UV treatment, aquatic chemistry, natural organic matter, adsorption processes and metal interactions in aquatic systems, drinking water quality, disinfection, disinfection by-products, soil-metal interactions, oxide surface-natural organic matter-metal interactions, soil remediation.

Education :

- B.S. in Chemistry/Physics, Ege University, 1973
- Ph.D. in Food Engineering Faculty, Food Sciences, Ege University, 1979

Academic Career :

- Professor, Bogazici University, Institute of Environmental Sciences, 1997-
- Associate Professor, Bogazici University, Institute of Environmental Sciences, 1991
- Assistant Professor, Bogazici University, Department of Chemistry, 1986

Work Experience :

- 1985-1986, B.U., Institute of Environmental Sciences, Instructor
- 1986-1988, B.U., School of Arts and Sciences, Chemistry Dept., Assist. Prof.
- 1988-1990, TUBITAK MAM, Dept. of Nutrition and Food Technology., Researcher
- 1989-1990, B.U., Institute of Environmental Sciences, Part-time Member of Faculty
- 1990-present, B.U., Institute of Environmental Sciences, Member of Faculty.
- 1991-1993, IES, Deputy Director
- 1991-1993, IES, Member of Institute Executive Committee
- 1991-1993; 2000-2005, IES, Member of Institute Board
- 2000-2005, IES, Head Environmental Sciences Division

Professional Honors, Awards, and Recognitions :

B.S. degree with high distinction, 1973, EU.

BUVAK Outstanding Achievement in Research, 2004.

Member of the Specialist Group on AOPs (Advanced Oxidation Processes) within IWA (International Water Association)

Member of the International Scientific Committee of the Conference on Solar Chemistry and Solar Photocatalysis: Environmental Applications

Courses Taught :

- ESC 505 Public Health Engineering
- ESC 551 Environmental Chemistry
- ESC 552 Chemistry for Environmental Science and Engineering
- ESC 553 Chemistry of Natural Water Systems
- ESC 692 STES: Drinking Water Disinfection and Health Aspects
- ESC 59A: Agriculture and Environment

Selected Research Projects :

BAP Projeleri

The Role of Anion Doping on the Photocatalytic Performance of TiO₂, 2012-.

Light Induced Degradation of Humic Acids in Aqueous Systems, 2010.

Investigation of the Surrogate Parameters for the Assessment of Eutrophication in Natural Water Systems, 2008.

Clay Adsorption and Pretreatment Efficiency of Natural Organic Matter in Drinking Water Treatment, 2008.

Integration of Spectroscopic Techniques for the Characterization of Natural Organic Matter in Drinking Water Supplies, 2005.

Removal of Algal Derived Organic Matter by Heterogeneous Photocatalytic Oxidation, 2005

An Investigation on the Disinfection Byproduct Precursor Speciation in Drinking Water, 2005.

Comparative Evaluations of Humic Acid Structure Under Different Oxidative Conditions, 2003.

Structural Characterization of Humic Substances by Spectroscopic Techniques in Relation to Photocatalytic Oxidative Degradation, 2003.

Sequential Oxidation of Humic Acids by Ozonation and Photocatalysis, 2002.

Soil Pesticide Interactions and Investigation of Alternative Removal Methods, 2000.

Assesing the Chelating Effects of Humic Substances on TiO₂-Metal Interactions by Using Model Compounds, 2000.

İçme Sularında Bulunan Doğal Organik Maddelerin İleri Oksidasyon Teknikleri ile Giderimi, 1999.

İçme Sularında Olusan Dezenfeksiyon Yan Ürünlerinin Fotokatalitik Yöntemle Giderilmesi, 1997 .

İmmobilize ve Serbest Halde Bulunan Yarı İletkenlerin Sulardaki Fotokatalitik Etkilerinin İncelenmesi, 1995.

İçme Suyu Sistemlerinde Organik Halojenürlerin Olusum Mekanizmasının Inc. Kirletici Yüklerin Saptanması, 1995.

Sularda Bulunan Patojen Bakterilerin Fotokatalitik Solar Sistemle Sürekli Sterilizasyonu, 1993.

Fotobakteriler Yardımıyla Organik Kökenli Atıklardan Hidrojen Üretimi 1988.

TÜBİTAK Projeleri

Development and ecological character on the cotton textile by disposition of TiO₂ and metal doped TiO₂, possible effects in the environment and solution potential, 2011-.

Toxicity-oriented control of advanced oxidation processes: A case study on phenol derivatives, 2011-.

Üç Ayrı Ülkede Temiz Su Elde Etmek İçin Uygun Su Arıtma Sistemlerinin Değerlendirilmesi, 2005.

İçme Sularının Dezenfeksiyonu Sonucu Yan Ürünlerin Oluşumları ve İleri Oksidasyon Teknikleri İle Giderilmelerinin İncelenmesi, 1997.

Nano Kristal Titanyum Dioksit Film Tabakası Uygulaması ile Foto (elektro) Katalitik (FEK) Solar Arıtma Sistemlerinin Geliştirilmesi ve İçme Suyu Arıtımında Kullanılması, 2005.

TiO₂ ve Metal Dopingli TiO₂ Nano Partikül Kaplama ile Pamuklu Tekstil Yüzeylerinde Ekolojik Çok fonksiyonlu Karakterlerin Oluşturulması, Olası Çevresel Etkiler ve Çözüm Yöntemleri, 2008.

NATO Projesi

Evaluation of Alternative Water Treatment Systems for Obtaining Safe Water in Three Countries, 2004, Italy, Armenia and Turkey.

The Italian Ministry of Education, University and Research (MIUR) Projesi

Evaluation of Advanced Oxidation Processes for Wastewater Treatment, Disinfection and Re-Use, 2006.

Devlet Planlama Teşkilatı (DPT) Projesi

Ozon, Biyofiltrasyon ve Nano Film Bazlı Fotokatalitik Arıtma Seçenekleriyle İçme Suyu Kalitesinin Kimyasal ve Mikrobiyolojik Olarak Artırılması, 2006.

Book Chapters:

Uyguner, C.S., Bekbölet, M., Chapter 7.4. Green Chemistry for Green Treatment Technologies in Emerging Compounds Removal from Wastewater Natural and Solar Based Treatments (Eds.Lofrano, G.), pp. 1-11, Springer, NY, USA, 2012.

Uyguner, C.S., Bekbölet, M., Aqueous Photocatalysis, Natural Organic Matter Characterization and Removal: A Case Study of the Photocatalytic Oxidation of Fulvic Acid, in Dangerous Pollutants (Xenobiotics) in Urban Water Cycle (Eds. P. Hlavinek, O. Bonacci, J. Marsalek, I. Mahrikova), pp. 247-256, Springer Verlag Inc., NY, USA, 2008.

Bekbölet, M., Chapter 1.5. Photocatalytic inactivation of microorganisms in drinking water, Control of Disinfection By-Products in Drinking Water Systems (Eds. A. Nikolau, H. Selcuk, L. Rizzo), pp. 97-117, NOVA Science Publishers Inc., NY, USA. 2007.

Uyguner, C.S., Bekbölet, M., Swietlik, J., Chapter 5.1. Natural Organic Matter: Definitions and Characterization, Control of Disinfection By-Products in Drinking Water Systems (Eds. A. Nikolau, H. Selcuk, L. Rizzo), pp. 253-277, NOVA Science Publishers Inc., NY, USA.

2007.

Uyguner, C.S., Bekbölet, M., Chapter 7.4. A Review on the Photocatalytic Degradation of Humic Substances, Control of Disinfection By-Products in Drinking Water Systems (Eds. A. Nikolau, H. Selcuk, L. Rizzo), pp. 419-446, NOVA Science Publishers Inc., NY, USA. 2007.

Selected Publications :

Karci, A., Arslan-Alaton, I., Olmez-Hanci, T. and Bekbölet, M., Transformation of 2,4-dichlorophenol by H₂O₂/UV-C, fenton and photo-fenton processes: oxidation products and toxicity evolution, *Journal of Photochemistry and Photobiology A: Chemistry*, 230, 65, 2012.

Selcuk, H., Meric, S., Nikolaou, A.D. and Bekbolet, M., A comparative study on the control of disinfection by-products (DBPs) and toxicity in drinking water, *Desalination and Water Treatment*, 26, 165, 2011.

Baycan Parilti, N., Uyguner-Demirel, C.S and Bekbolet, M., Response surface methodological approach for the assessment of the photocatalytic degradation of NOM, *Journal of Photochemistry and Photobiology A: Chemistry*, 225, 26, 2011.

Uyguner-Demirel, C.S and Bekbolet, M., Significance of analytical parameters for the understanding of natural organic matter in relation to photocatalytic oxidation, *Chemosphere*, 84, 1009, 2011.

Uyguner, C.S. and Bekbolet M., TiO₂-assisted photodegradation of humic acids: effect of copper ions, *Water Science and Technology*, 61, 10, 2581, 2010.

Güngör, E.B.Ö. and Bekbölet M., Zinc release by humic and fulvic acid as influenced by pH, complexation and DOC sorption, *Geoderma*, 159, 1-2, 131, 2010.

Kavurmaci, S.S. and Bekbolet, M., The role of oxidative treatment on the trivalent cation complexation properties of natural organic matter, *Journal of Advanced Oxidation Technologies*, 13, 2, 212, 2010.

Bekbolet, M., Çınar, Z., Kılıç, M., Uyguner, C.S., Minero, C., and Pelizetti, E., Photocatalytic degradation of dinitronaphthalenes: theory and experiment, *Chemosphere*, 75, 8, 1008, 2009.

Uyguner, C.S. and Bekbolet, M., Application of photocatalysis for the removal of natural organic matter in simulated surface and ground waters, *Journal of Advanced Oxidation Technologies*, 12,1, 87, 2009.

Rizzo, L., Rocca, C.D., Belgiorno, V., Bekbolet, M., Application of photocatalysis as a post treatment method of a heterotrophic autotrophic denitrification reactor effluent, *Chemosphere*, 72, 11, 1706, 2008.

Selcuk, H. and Bekbolet, M., Photocatalytic and photoelectrocatalytic humic acid removal and selectivity of TiO₂ coated photoanode, *Chemosphere*, 73, 5, 854, 2008.

Uyguner C.S., Selcuk H., and Bekbolet M., A Comparative approach to the application of a physico chemical and advanced oxidation combined system to natural water samples, *Separation Science and Technology*, 42, 7, 1405, 2007.

Uyguner, C.S., Suphandag, S.A., Kerc, A., and Bekbolet, M., Evaluation of adsorption and coagulation characteristics of humic acids preceded by alternative advanced oxidation techniques”, *Desalination*, 210, 183-193, 2007.

- Uyguner, C.S. and Bekbolet, M., Contribution of metal species to the heterogeneous photocatalytic degradation of natural organic matter, *International Journal of Photoenergy*, Volume 2007, Article ID 23156, 1, 2007.
- Selcuk, H., Rizzo, L., Nikolaou, A.N., Meric, S., Belgiorno, V., and Bekbolet, M., DBPs formation and toxicity monitoring in different origin water treated by ozone and alum/PAC coagulation, *Desalination* 210, 31, 2007.
- Rizzo, L., Uyguner, C.S., Selcuk, H., Bekbolet M. and Anderson, M., Activation of solgel titanium nanofilm by UV illumination for NOM removal", *Water Science and Technology*, 55, 12, 113, 2007.
- Süphandağ Ş.A., Uyguner, C.S., Bekbölet, M., İstanbul'da tüketilen ticari ve şebeke bazı içme sularının kimyasal ve spektroskopik profilleri, itüdergisi/e, su kirlenmesi kontrolü, 17, 2, 23, 2007.
- Uyguner, C.S. and Bekbolet, M., A comparative study on the photocatalytic degradation of humic substances of various origins, *Desalination*, 176, 167, 2005.
- Uyguner, C.S. and Bekbolet, M., Implementation of spectroscopic parameters for practical monitoring of natural organic matter, *Desalination*, 176, 47, 2005.
- Uyguner C.S., Bekbolet M., Evaluation of humic acid photocatalytic degradation by UV vis and fluorescence spectroscopy, *Catalysis Today*, 101, 267, 2005.
- Bekbolet M., Uyguner C.S., H. Selcuk, L. Rizzo, A.D. Nikolaou, S. Meric, V. Belgiorno, Application of oxidative removal of NOM to drinking water and formation of disinfection by-products, *Desalination*, 176, 155, 2005.
- Uyguner, C.S. and Bekbolet, M., Evaluation of Humic Acid, Chromium (VI) and TiO₂ Ternary System In Relation to Adsorptive Interactions, *Applied Catalysis B: Environmental*, 49, 4, 267, 2004.
- Uyguner, C.S. and Bekbolet, M., Photocatalytic Degradation of Natural Organic Matter: Kinetic Considerations and Light Intensity Dependence, *International Journal of Photoenergy*, 6, 2, 73, 2004.
- Kerç, A., Bekbolet M. Saatci A.M., Effects of Oxidative Treatment Techniques on Molecular Size Distribution of Humic Acids, *Water Science and Technology*, 49, 4, 7, 2004.
- Kerc, A., Bekbolet, M. Saatci, A. M., Effect of Partial Oxidation by Ozonation on the Photocatalytic Degradation of Humic Acids, *International Journal of Photoenergy*, 5, 75, 2003.
- Kerc, A., Bekbolet, M. Saatci, A. M., Sequential Oxidation of Humic Acids by Ozonation and Photocatalysis, *Ozone Science and Engineering*, 25, 6, 497, 2003.
- Kerç, A., Bekbölet, M. Saatçi, A.M., Effect of partial oxidation by ozonation on the photocatalytic degradation of humic acids, *International Journal of Photoenergy*, 5, 75, 2003.
- Bekbölet, M., Süphandağ, Ş.A., Uyguner, C., An Investigation of the Photocatalytic Efficiencies of TiO₂ Powders on the Decolorization of Humic Acids, *Journal of Photochemistry and Photobiology, A. Chemistry*, 148, 121, 2002.
- Gönenç, D. Bekbölet, M., Interactions of hypochlorite ion and humic acid: photolytic and photocatalytic pathways, *Water Science and Technology*, 44, 5, 205, 2001.
- Balcioglu, A.I., Getoff, N., Bekbölet, M., A Comparative Study for the Synergistic Effect of Ozone on the Gamma-irradiated and Photocatalytic Reactions of 4-Chlorobenzaldehyde,

Journal of Photochemistry and Photobiology A: Chemistry, 2000.

Bekbölet, M., Getoff, N., Radiation Induced Decomposition of Chlorinated Benzaldehydes in Aqueous Solution, Radiation Physics and Chemistry, 56, 3, 333, 1999.

Bekbölet, M., Boyacıoğlu, Z., Özkaraova, B., The Influence of Solution Matrix on the Photocatalytic Removal of Colour from Natural Waters, Water Science and Technology, 38, 6, 155, 1998.

Bekbölet, M., Getoff, N., Photocatalytic Decomposition of Chlorinated Benzaldehydes in Aqueous Solution Using TiO₂, Journal of Advanced Oxidation Technologies, 3, 2, 162, 1998.

Bekbölet, M., Photocatalytic Bactericidal Activity of TiO₂ in Aqueous Suspensions of *E-Coli*, Water Science and Technology, 35, 11-12, 95, 1997.

Bekbölet, M., Lindler, M., Weichgrebe, D., Bahnemann, D., Photocatalytic Detoxification with the Thin-Film-Fixed-Bed Reactor (TFFBR): Clean-up of Highly Polluted Landfill Effluents Using a Novel TiO₂ Photocatalyst, Solar Energy, 56, 5, 455, 1996.

Bekbölet, M., Destructive Removal of Humic Acids in Aqueous Media by Photocatalytic Oxidation with Illuminated Titanium Dioxide, Journal of Environmental Science and Health Part A Environmental Science and Engineering, 31, 4, 845, 1996.

Bekbölet, M., Araz, C.V., Inactivation of *E.coli* by Photocatalytic Oxidation, Chemosphere, 32, 5, 959, 1996.

Bekbölet, M., Özkösemen, G.A., Preliminary Investigation on the Photocatalytic Degradation of a Model Humic Acid, Water Science and Technology, 33, 6, 189, 1996.

Bekbölet, M., Çeçen, F., Özkösemen, G., Photocatalytic Oxidation and Subsequent Adsorption Characteristics of Humic Acids, Water Science and Technology, 34, 9, 65, 1996.

Bekbölet, M., Balcioglu, I., Photocatalytic Degradation Kinetics of Humic Acids in Aqueous TiO₂ Dispersions: The Influence of Hydrogen Peroxide and Bicarbonate Ion, Water Science and Technology, 34, 9, 73, 1996.