

**Prof. Etelka Tombácz, PhD, DSc, habil.**

University of Pannonia, Veszprém, Hungary  
Soós Water Technology Research and Development Center,  
Nagykanizsa, Hungary  
ORCID: 0000-0002-2068-0459  
Researcher ID: K-1497-2016  
E-mail: [tombacz@chem.u-szeged.hu](mailto:tombacz@chem.u-szeged.hu)  
[tombacz.etelka@pen.uni-pannon.hu](mailto:tombacz.etelka@pen.uni-pannon.hu)

**Education**

Habilitation, Chemistry (2005), University of Szeged, Hungary;  
DSc (Title: Soil relevant interfacial and colloid interactions), Physical Chemistry (2004), Hungarian Academy of Sciences, Budapest;  
PhD (CSc, Title: Interaction of anionic organic compounds with montmorillonite), Colloid Chemistry (1986), Hungarian Academy of Sciences, Budapest;  
Doctorate (Title: Colloidal behavior of humic acids and alkali metal humates) (1977), Attila József University, Szeged;  
Graduated Chemist (1975), Attila József University, Szeged;  
Chemical Technician (1970), Technical High School, Debrecen.

**Positions**

Scientific advisor (2024-), full professor (2020-23) at the University of Pannonia, Veszprém, Hungary; Leader of Aqueous Colloids Research Group (2009-2016), Full professor (2006-2016), Associate Professor (1988-2006), Assistant Professor (1983-1988) Postdoctoral Fellow (Candidature; 1979-1983) and Research Assistant (1975-1979) at the Department of Colloid Chemistry, Attila József University (1975-2000), University of Szeged (from 2000), Szeged, Hungary.

Invited professor (6 weeks in 2012, 4 weeks in 2013) at the Institute of Experimental Physics Slovak Academy of Sciences, Košice, Slovak Republic and (4 weeks in 2007, 6 weeks in 2006) at the DIOM, Université Jean Monnet, Saint Etienne, France; Invited Researcher (1994/95) at the Department of Chemistry and Biochemistry, South Dakota State University, SD, USA; Postdoctoral Fellow (1989/1990) at the Department of Chemistry, Baylor University, Texas, USA.

**Research Activities**

The main activities are performing and supervising of research dealing with interfacial equilibrium and colloidal destabilization of aqueous systems, the pH and electrolyte dependent surface charging and colloidal characterization of clay minerals (montmorillonite, kaolinite) and metal oxides (iron, aluminum, titanium and zinc oxides), as well as their surface modification with natural or biocompatible complexing agent to manipulate the particle-particle interactions, either to enhance colloidal stability in composite systems, especially in water based magnetic fluids for theranostic purpose or to be reduced during water purification. Effect of magnetic field on the aggregation state of aqueous colloidal systems, destabilization, magnetic separation.

**Publications:** at <https://scholar.google.com/citations?pagesize=100&user=OyXyQLQAAAJ>

**Number of papers** 151 (peer-reviewed); Citation: 11583; H-index: 58, i10-index: 116 (Google scholar); **Presentations at International and National Meetings:** 147 (21 invited lectures and 53 lectures).

**National and EU research grants:** principal investigator on 11 national grants (e.g., OTKA project (1441/91) *Comparative study on the interactions of colloidal particles dispersed in water under the effect of gravitational, centrifugal and magnetic fields* 1991-94; OTKA project (T034755) *Particle aggregation in complex aqueous systems* 2001-2004; Óveges József project (OMFB-01604/2006) *Superparamagnetic magnetite*

*nanoparticles in composite aqueous systems* 2006-2007; OTKA project (A7-69109/2007) *Preparation and investigation of biocompatible magnetic fluids* 2007-2010), **co-principal investigator** on 3 international grants (FP6 GOCE-CT-2003-505450) *Indicators and thresholds for desertification, soil quality, and remediation* 2004-2007; JSPS-HAS Cooperative Project (JSPS/109) *Flocculation and interfacial dynamics of clay colloid as a reactive carrier in soil and groundwater system*, 2008-2010; TÉT project (FR-17/2009) *Magnetic nanoparticles for magneto-optical thin film* 2011-2012) and **participant** in 2 international projects (IPA Project HUSRB/1002/214/193) *Bile Acid Nanosystems as Molecule Carriers in Pharmaceutical Applications* 2011-2013; ITMS Project (26110230061 ECVV- NANOKOP, Slovakia) *Educational Centre for Research and Development of Complex Nanosystems* 2011- 2013). OTKA (NK-84014) project *Magneto responsive iron oxide nanoparticles for biomedical use* 2011-2015. **Co-Proposer** in a COST (oc-2013-2-17089) proposal *Multifunctional Nanoparticles for Magnetic Hyperthermia and Indirect Radiation Therapy*. **MC member in** COST Action RADIOMAG TD1402 2014-2018. At present, participant in a Project “*Körforgásos gazdasági alapokon nyugvó fenntarthatósági kompetencia központ létrehozása a Pannon Egyetemen*” (2019-1.3.1-KK-2019-00015, 2020-2023).

Several **R&D grants** from industry on aqueous suspension formulation (ceramic, paint, phosphor) and cosmetics were directed.

**Teaching activities** Undergraduate courses: *Colloid Chemistry, Environmental Colloids*, Graduate courses: *Aqueous Colloidal Dispersion, Rheology, Polymers, Food rheology*, PhD courses: *Interfacial Equilibria and Dispersion Stability in Aqueous Medium, Humic Substances in the Environment*

**Seven PhD theses** were defended under my supervision. Illés, Erzsébet (2005) *Interaction of humic acids with magnetite nanoparticles: from soils to magnetic fluids*; Majzik, Andrea (2008) *Interfacial and colloid interactions in complex aqueous disperse systems containing montmorillonite, iron oxide, humic acids and calcium ions*; Czibulya, Zsuzsanna (2010) *Rheological investigations of soil suspensions*; Hajdú, Angéla (2010) *Synthesis and stabilization of magnetic fluids under physiological conditions with the view of biomedical applications*; Kovács Krisztina (2011) *Characterization of humic substances isolated from thermal waters of south-east Great Plain*; Tóth Ildikó (2013) *Synthesis of variable sized magnetite nanoparticles and their surface modification by polyanionic coatings*; Sárainé Rauch Renáta (2021) „*Study of the sorption properties of alginate for the removal of organic pollutants*”

Currently, the **PhD candidate's supervisor** is: Csicsor, Attila (defense planned in 2025) “*Antioxidant properties of humic acids*”

**Reviewing for international journals:** Colloids and Surfaces A. (Elsevier), Colloids and Surfaces B. (Elsevier), Colloid and Polymer Science (Springer), Applied Clay Science (Elsevier), J. Colloid Interface Sci. (Elsevier), Angewandte Chemie (GDCh, Wiley-VCH), European Journal of Soil Science (Blackwell), Geoderma (Elsevier), Geochimica et Cosmochimica Acta (Elsevier), Organic Geochemistry (Elsevier), Langmuir (ACS), J. Chemical Information and Computer Sciences (ACS), Croatica Chemica Acta (Zagreb), Soil Sci. Soc. Am. J. (ASA, SSSA), Water Research (Elsevier), Environ. Sci. Technol. (ACS); Crystal Growth & Design (ACS); Chemosphere (Elsevier), Clay Minerals (Mineralogical Society), Clays and Clay Minerals (Clay Min. Soc.), Periodica Polytechnica Chemical Engineering (BUTE), Materials Research Bulletin (Elsevier), Journal of Nanoparticle Research (Springer), Physical Chemistry Chemical Physics (RSC), Science of Advanced Materials (ASP), The Journal of Physical Chemistry (ACS), Journal of Nanoparticle Research (Springer), Physical Chemistry Chemical Physics, Nanoscale (RSC), PLOS ONE (PLOS)

### **Chair person of international meetings:**

COST – RADIOMAG Final Meeting, Firenze, Villa Ruspoli 16th – 18th October 2018

12th International Conference on the Scientific and Clinical Applications of Magnetic Carriers, May 22-26, 2018. Copenhagen, Denmark

COST–RADIOMAG Annual Action Progress Conference, Timisoara, Romania 22-23 March 2018

11th International Conference of Scientific and Clinical Applications of Magnetic Carriers, May 31-June 4, 2016. Vancouver, BC, Canada

2nd International Conference on Nanotheranostics, ICoN2015, 29 Oct – 01 Nov 2015, Limassol, Cyprus  
Workshop "Multifunctional nanoparticles...", 25-26 June, 2015, Timisoara, Romania

27<sup>th</sup> Conference of the European Colloid and Interface Society (ECIS 2013), 1-6 Sept, 2013. Sofia, Bulgaria

COST Action CM1101 Meeting, May 26-28, 2013. Szeged, Hungary

10<sup>th</sup> Conference on Colloid Chemistry, August 29-31, 2012. Budapest, Hungary

International Workshop "Nanoparticles and Complex Nanostructures for Biotechnology, Biomedicine and Microfluidics", June 21-22, 2012, Romanian Academy – Timisoara, Romania

Surface Chemistry and Performance of Carbon Materials (PRECARB-12) 15-16 June, 2012. Budapest, Hungary

7<sup>th</sup> International Conference on Interfaces Against Pollution (IAP2012), 11-14 June 2012. Nancy, France

6<sup>th</sup> International Conference on Interfaces Against Pollution (IAP2010) May 16-19, 2010, Beijing, China

Workshop on "SMART FLUIDS AND COMPLEX FLOWS", 5-6 June, 2009, Timisoara, Romania  
 5th International Conference on Interfaces Against Pollution (IAP08) June 1-4, 2008, Kyoto, Japan  
 Moderator of Round Table Discussion, 14<sup>th</sup> IHSS, Sept 14-19, 2008. Moscow - Saint Petersburg, Russia  
 11th International Conference on Magnetic Fluids (ICMF 11), July 23 - 27, 2007. Košice, Slovakia  
 9th Conference on Colloid Chemistry, Oct 3 – 5, 2007 Siófok, Hungary  
 Workshop on "Magnetic nanofluids and composites", July 22-25, 2006, Timisoara, Romania  
 3rd Mid-European Clay Conference, Opatija, Croatia, Sept 18-22, 2006.  
 IV. International Conference on Interfaces Against Pollution, Granada, Spain, June 4-7, 2006.  
 13<sup>th</sup> International Humic Substances Society Meeting, Karlsruhe, Germany, July 30 to Aug 4, 2006.  
 8<sup>th</sup> Int. Symp. Interdisciplinary Regional Research (ISIRR-8), Szeged, Hungary, April 19-21, 2005.  
 Workshop on Magnetizable Nanofluids and Nanocomposites, 26-27 May, 2005. Timisoara, Romania  
 IAP2004 (3rd Conference on Interfaces Against Pollution) Jülich, Germany, May 24-27, 2004.  
 2<sup>nd</sup> Mid-European Clay Conference (MECC'04) Miskolc, Hungary, Sept 20-24, 2004.  
 9<sup>th</sup> Int. Symp. Particle Size Anal., Environ. Protection Powder Techn., Balatonfüred, Hungary, Sept 5-7, 2004.  
 IAP-2002, Interfaces Against Pollution, Miskolc, Hungary, May 27-30, 2002.  
 20th Anniversary Conference of IHSS, Boston, MA, USA, July 21-26, 2002.  
 8th Conference on Colloid Chemistry, Keszthely, Hungary, September 18-20, 2002.  
 8th Int. Symp. Part. Size Anal., Environ. Protection Powder Techn., Eger, Hungary, 2001. szeptember 13-14.  
 3rd Int. Conf. Land Degrad., Meeting of the IUSS Submission C, Rio De Janeiro, Brazil, Sept 17-21, 2001.  
 10th Meeting of the International Humic Substances Society, Toulouse, France, 24-28 July 2000.  
 3rd International Conference of the Kolloid-Gesellschaft e.V, Budapest, Hungary, 25-28 Sept, 2000.  
 XIII ISEB – Int. Symp. Environ. Biogeochem., Monopoli (Bari), Italy, September 21-26, 1997.  
 8th Meeting of the International Humic Substances Society, Sept 9-14, 1996, Wroclaw, Poland  
 7th Conference on Colloid Chemistry, Sept 23-26, 1996, Eger, Hungary  
 6th Meeting of the International Humic Substances Society, Monopoli (Bari), Italy, 20-25 Sept 1992.

### **Conference organization**

11th Conference on Colloid Chemistry, 28-30 May, 2018. Eger, Hungary – Chair of organizing committee  
 "Design & testing of specific coil geometries (including their proper calibration)" RADIOMAG TD1402 COST action, WG2/WG4 subgroup meeting, 6-7 March, 2017, Szeged, Hungary - organizer

### **Awards, Honors, Membership and Other Activities**

Member of the Hungarian Chemical Association, Technical and Scientific Committee from 2019 to present  
 Member of the Physical Chemistry Section Editorial Board of Molecules (MDPI) from 2019 to present  
 Preisch, Miklós award of Hungarian Chemical Society (2018)  
 Polányi, Mihály award of Hungarian Academy of Sciences (2016)  
 Associate Editor of Applied Clay Sciences (Elsevier) in 2013  
 Member of the editorial board of Colloids and Surfaces A (Elsevier) from 2010 to 2013  
 Associate Member of the IUPAC body Chemistry and Environment (VI) for the term 2010-2011  
 Member of the editorial board of Applied Clay Sciences (Elsevier) from 2009 to 2022  
 Master Teacher Medal (2007) OTDK committee  
 Board member of the International Humic Substances Society 2006-2010  
 President of Colloid Chemistry Working Committee of Hungarian Academy of Sciences 2005-2012  
 Hungarian representative of International Board of ELKIN (electrokinetics) 2005-2013;  
 Member of the editorial board of Colloid and Polymer Science (Springer) from 2004 to 2021;  
 Member of the international advisory board of IAP (Interfaces Against Pollution) from 2004 to 2016;  
 Member of the IUPAC Division VI-Chemistry and Environment (DCE) 2003-2009;  
 Recipient of a Széchenyi Professor Fellowship 1998-2001 and István Széchenyi Fellowship 2001/02-2003/04;  
 Member of IHSS and the Hungarian Coordinator for the International Humic Substances Society from 1992;  
 Aladár Buzágh Prize, Hungarian Academy of Sciences (1982);  
 The Winner of National Secondary School Academic Competition in Chemistry (1970)