

**IWACST
2013**

International Workshop on Advances in Coagulation Science and Technology

22-27 Sep., 2013 Beijing



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Coagulation, the process of inducing particle aggregation by manipulating solution and particle properties, continues to be a topic of critical importance in water and wastewater treatment.

Coagulation has been a topic of long history, a field of fundamental scientific interest, and a problem of significant complications. Despite many significant advances in recent years, there are still major knowledge gaps and urgent research needs.

Indeed, recent attention on the nature and behaviour of synthetic and naturally occurring nano-particles and nano-pollutants, and the increasing use of molecular characterisation methods have resulted in advances enabling the closer coupling of underpinning mechanistic understanding of particle-particle associations with end-use applications in the water industry. Advances in these areas will be presented at the forthcoming International Workshop on Advances in Coagulation Science and Technology (IWACST) to be held in Beijing from 22-27 September, 2013. Keynote, invited and contributed papers in which advances in underpinning understanding of coagulation processes as well as improvements in process optimisation and control will be presented.

The aim of the Workshop is to provide a platform for critical reviews and comprehensive discussions on recent advances and research needs in coagulation science and technology, to improve our knowledge and understanding of the basic principles and of process control in water and wastewater treatment. This Workshop will bring together the world-renowned researchers from different focus and publish a monograph as a result. Considering the big challenges as well as chances in coagulation, the IWACST2013 will be a new milestone in this field.


Best regards

Chairman, Organising committee

Prof. Dongsheng Wang, Xiaoyan Li,
Yasuhisa Adachi, T. David Waite

Honorary Chairman

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International Workshop on Advances in Coagulation Science & Technology - towards the complete understanding of the basic principles and process control

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Main topics of coagulation science and technology

Particle aggregation in the field of water and wastewater treatment is a very important topic. Particle characterization, focusing on particle behavior, especially the role of aqua-sol, aquatic organic matters, and currently nano-materials, enables better development of the processes of solid/liquid separation, and the definition and solution of environmental problems. Coagulation chemistry has changed dramatically in recent decades. Advances in instrumentation make it possible for us to “see” the speciation and collision behavior of the aggregates. The development of physico-chemical hydrodynamics has taken place in highly favorable circumstances for the growth of an engineering science. Polymeric flocculants (IPFs and OPFs) are gaining more interest in order to deal with changing raw water quality and to meet more strict regulatory requirements for effluent quality. Mechanism of action, speciation and transformation of the coagulant is still the key for the development of new flocculants. Also, nano-IPFs and multi-functional flocculants are now potentially able to solve process optimization needs.

I. Particles in water: Role of aqua-sol, DOM

Research Needs

- DOM characterization methods;
- Aqua-sol and particle analysis and separation;
- Water quality data base;
- Role of particles in coagulation;
- Nano-particles and micro-particles, miscellaneous.

II. Scientific basis of Coagulation

Research Needs

- Aqua-EDL, Extended DLVO, SCM models etc.;
- Traditional vs. modified coagulation mechanism;
- Particle-particle interaction considering the nature of particles;
- Natural complexity in coagulation;
- Theory for coagulation with IPFs: speciation stability, kinetics, multi-fractal aggregation, contact flocculation, F-R-D system;
- Electro-patch coagulation;
- Miscellaneous effects of PSD of IPFs and OPFs.

III. Scientific basis of Coagulation Technology

Research Needs

- Fractal theory and floc control;
- Coagulation dose control;
- Application of CFD and PIV, fluid dynamic aspects;
- Process control considering the natural complexity;
- Micro-pollution control during coagulation;
- Integrated optimum coagulation system.

IV. Scientific basis of novel coagulants (IPFs and OPFs)

Research Needs

- Speciation classification and analysis methodology;
- Purification of hydrolysed clusters and nano-species;
- Hydrolysis-polymerization mechanism, speciation transformation models;
- Speciation stability and role of preparation conditions;
- Nano-IPFs, preparation technology.

V. Applied aspects of Coagulation

Research Needs

- Role of changing water quality;
- Role of unit process;
- Role of coagulation, aggregation and separation: Technical aspects;
- Application in membrane fouling control;
- Other aspects, etc.