

## Editorial

### New developments in particle separation

It is a pleasure to introduce to the readers of *Journal of Water Supply: Research and Technology - AQUA* this theme issue on particles. We solicited papers on this subject a little more than a year ago. This generated great interest from both researchers and practitioners yielding a large number of submitted manuscripts. The manuscripts underwent a rigorous peer review process using three expert reviewers for each paper. Fourteen papers were selected for publication. We have published all these papers in this theme issue by combining the last two issues of *Journal of Water Supply: Research and Technology - AQUA* of 2006.

Why choose a theme issue on particles? Our concerns about particles in drinking waters have to do with aesthetics, health, and tastes and odors. Particles in water supplies present challenges due to their wide range of sizes, surface properties, and types. Particles cover a wide range of sizes from as small as 0.01  $\mu\text{m}$  in raw waters to flocs of 100 s of  $\mu\text{m}$  in water plants. Of paramount concern are pathogens. These include viruses (sizes of 0.01 to 0.1  $\mu\text{m}$ ), bacteria (about a 1  $\mu\text{m}$  in size), and small suspended protozoa of *Cryptosporidium* oocysts (a few to several  $\mu\text{m}$ ) and *Giardia* cysts ( $\sim 10 \mu\text{m}$ ). Many mineral particles of colloidal size (micron or less) occur in water supplies that can cause aesthetic and health problems. Health concerns may be due directly to the particles, for example asbestos minerals, or indirectly through the adsorption of dissolved contaminants such as disinfection by-product precursors or pesticides. Algae (few  $\mu\text{m}$  to 10s of  $\mu\text{m}$ ) can cause a number of problems such as tastes and odors and are a particulate source of disinfection by-products. Within water plants we have various pretreatment processes and

particle separation processes for the particles initially in the water supply and for new particles formed in treatment. We form particles from coagulation (metal hydroxide solids) and oxidation processes (e.g. ferric hydroxides and manganese oxides), and we convert dissolved natural organic matter (precursor of disinfection by-products) into particles by causing a phase change. Thus, the drinking water field has a great interest in the properties of particles and in separation processes for their removal, hence this special theme issue.

By providing extensive coverage on one subject, the fourteen papers in this theme issue provide a valuable resource for our readers. The authors are from some seven countries so you may also learn about problems and research around the world. The subjects cover characterization of particles and flocs, dissolved air flotation, granular media filtration, and membrane treatment. We hope you enjoy and make use of this theme issue.

We would like to hear from you. Please e-mail any comments you have about this issue to James K. Edzwald: edzwald@ecs.umass.edu. We would also like to hear from you about ideas of potential subjects for future theme issues. If you have a particular subject that you believe would make a good theme issue, please e-mail me or the editor in your region. Addresses for Professor Gimbel (Europe, Africa, Western Asia, and Australasia) and Professor Watanabe (Asia Pacific) are given at the back of each issue of *Journal of Water Supply: Research and Technology - AQUA*.

**James K. Edzwald**

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