



2020-21 Rheology Lecture Series

The Australian Society of Rheology is presenting a national series of lectures, which is open to anyone interested in the flow and deformation of matter. The next event in the series will be held online.

Calendar details

Date:	Tuesday, October 19, 2021
Time:	9:00 to 10:30 AM (Melbourne, Australia)
Event Registration Link	https://www.eventbrite.com.au/e/australian-society-of-rheology-seminar-19-october-2021-registration-185603213207

Invited lecture

Prof Marek Pawlik

(Norman B. Keevil Institute of Mining Engineering at the University of British Columbia (UBC), Vancouver, Canada.)

Presentation Title: Applications of x-ray computed tomography in studying flocculation

Abstract: Research on flocculation often relies on measurements of the settling rate, turbidity, or the solids content in the settled bed. Although it is recognized that the chemical properties of the flocculant play an important role in the flocculation process, little effort is usually made to characterize the polymer itself. The flocculation of fine particles is facilitated by the size of the flocculant chain, and in particular by the ability of the polymer chain to assume a stretched conformation in solution, from which the bridging mechanism of flocculation can readily be visualized. In this presentation, it will be shown that the intrinsic viscosity of flocculants can be used not only as a measure of chain conformation (stretched or coiled), but also as a measure of the flexibility of the macromolecule. The importance of chain flexibility in flocculation will be shown for a range of polyacrylamide-based flocculants of different degrees of anionicity in flocculating fine silica. Finally, results from two studies on the use of x-ray computed tomography in measuring changes in the 3D structure and in floc/aggregate size distributions of a flocculated bed under pressure filtration will be presented to highlight the potential of the x-ray CT technique in flocculation research.



Speaker's biography



Dr. Marek Pawlik is a professor of mineral processing in Norman B. Keevil Institute of Mining Engineering at the University of British Columbia (UBC), Vancouver, Canada. He completed his B.Sc. in Chemistry (specialization: environmental and colloid chemistry), from Maria Curie-Skłodowska University, Lublin (Poland), 1994, and received his Ph.D. in Mineral Processing Engineering, from University of British Columbia, Vancouver, 2002. He has a vast experience of teaching undergraduate and graduate courses related to mineral processing, including a core course on froth flotation and an elective course on coal processing. His research interests cover interparticle and interfacial phenomena, froth flotation, surface chemistry of minerals, adsorption of polymers and surfactants, process water and reagent chemistry, and rheology of mineral suspensions. Currently he is

supervising studies on flocculation and dewatering of oil sand tailings, applications of x-ray computed tomography in studying structure of flocculated/thickened sediments, wettability of bitumen in the presence of various reagents, froth flotation of antimony- and arsenic-bearing base metal sulfide ores, and alternative depressants in chalcopyrite molybdenite flotation.

Dr. Pawlik is also associate faculty to the industrial research chair in hydrometallurgy, held by Dr. David Dreisinger from Materials Engineering at UBC. His role is to assist with relevant surface-chemical aspects of chair research and to provide short courses to chair sponsors on mineral processing topics.

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