

演 題 : **Flash Nanoprecipitation of Polymeric and Iron Oxide-Loaded Nanocarriers: Modelling, Colloidal Interactions and Magnetically Triggered Drug Release**



講 師 : **Prof. Sulalit Bandyopadhyay**
Department of Chemical Engineering,
Norwegian University of Science and Technology,
Norway

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場 所 : フロンティア応用科学研究棟 2 階セミナー室

要 旨 :

Flash nanoprecipitation (FNP) is a robust and scalable route to polymeric nanoparticles, yet mechanistic understanding of encapsulation of hydrophobic inorganic colloids, such as iron oxide nanoparticles (IONPs), remains unresolved. This talk presents work on FNP, from phase-field and population balance modelling of bare polymeric nanoparticles to PLGA encapsulation of IONPs made by thermal decomposition or by co-precipitation followed by oleic acid coating. Competing colloidal interactions, governed by solvent quality, dictate IONP clustering and encapsulation, enabling loadings of up to 43%. Co-encapsulating paclitaxel yields nanocarriers with at least fourfold higher drug release under an alternating magnetic field, offering insights for rational design of magnetically responsive nanocarriers.

連絡先 : 工学研究院応用化学部門 高分子化学研究室 磯野 拓也
(Email: isono.t@eng.hokudai.ac.jp 内線: 2290)