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## New insight of starch-based spherical microgels with tunable volume

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The spherical particles of Cationic Starch (CS) microgels could be prepared by partially gelatinizing the CS granules followed by stabilizing the swollen particles with cross linkers Sodium Tri-Meta-Phosphate (STMP). The desirable partial gelatinization process and the degree of STMP crosslinking was determined by using a rheometer equipped with a Couette fixture and Thermal Gravimetric Analysis (TGA), respectively. Swelling/de-swelling behavior of CS microgels responsive to various pH and ionic strength conditions were evaluated from several aspects of physical properties, including particle size distribution, swelling ratio and rheological properties. It is found that the partial gelatinization process (50°C, 10 min) could keep the most of CS swollen granules intact. STMP in CS microgel behaved as ionic and chemical crosslinkers, which were saturated at STMP/CS weight ratio of 0.2. The swelling behavior of CS microgels was dominated not only by the STMP crosslinking, but also by the excess cationic groups of CS, which were sensitive to the environmental salt concentration and pH. The rheological properties indicated that the excellent water uptaking ability of CS microgels raised their viscosity, which might undergo de-swelling at high salt concentration due to the highly deformable characters of CS microgels.

### Biography

Hsi-Mei Lai has completed her PhD from University of Illinois at Champaign and Urbana in 1990. She worked in China Grain Product Research and Development Institute, Taiwan as a Research Fellow for six years. Currently, she is the Professor and Head of Department of Agricultural Chemistry at National Taiwan University in Taipei, Taiwan. Her researches focus on the studies of biopolymers' properties and applications on the environmental friendly responsive (nano) materials for foods and pharmaceuticals. She has published more than 50 papers in reputed journals and serving as Editorial Board of Journal of Food and Drug Analysis. She is the President of Agricultural Chemistry Society of Taiwan.

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