From the Guest editors

THERMODYNAMICS FOR GREEN TEXTILES AND GREEN ENERGY

by

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Green textiles have been caught much attention recently. This issue focuses on green fabrication of nanomaterials including nanofibers, nanoparticles, and nanoporous materials using the bubble electrospinning and its various modifications [1].

The bubble electrospinning and its modifications use an external force, *e. g*., electrostatic force, blowing air, mechanical force, to overcome the surface tension of polymer bubbles. Thermodynamics plays an important role in the green fabrication, it can endow a bubble with a minimal surface tension, as a result minimal energy is required during the spinning process; see theoretical analysis in [2]. Furthermore environmental pollution and production pollution can be completely avoided due to no poisonous solvents involved in spinning process. Research group leaded by Dr. Ji-Huan He of Soochow University concentrates several themes on bubble electrospinning and its applications.

Thermodynamics is also an effect tool for morphology control of productions made by the bubble electrospinning, because temperature and pressure are two main factors controlling solvent evaporation. Suitable control of environmental temperature and pressure of the spinning jets can produce nanoporous fibers, super-thin films, particle-like beads, or nanofiber crimp; see papers by Jing Pang, *et al*., Rou-Xi Chen, *et al.*, and Hai-Bin Li, *et al.* in this issue.

Green energy becomes a social and political problem. With increasing requirements for environmental protection and the strict situation of energy shortage all over the world, all researchers in the world are looking for natural refrigerant to replace freons, which contribute to ozone depletion in the upper atmosphere. Thermodynamics is an effective tool for optimal design of heat pumps, and research group chaired by Dr. Xiao-Wei Fan of Zhongyuan University of Technology contributes much in this aspect.

This issue also concentrates thermodynamics for various environmental flows by Dr. Xiao-Hua Yang's group in Beijing Normal University, and Dr. Jian-Zhong Lin's group from Zhejiang University and China Jiliang University. Yang's group presented an optimization method and a gray-encoded hybrid accelerating genetic algorithm (GHAGA) for the parameter optimization of environmental models. Yang's optimization method is good for the para-

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meter optimization for the given environmental problems [3]. Furthermore, Yang's prediction method can improve the forecast accuracy in the given environmental problems [4], and Yang's assessment model can fully take advantage of certain and uncertain knowledge, subjective and objective information [5], see papers by Xiao-Hua Yang and her colleagues in this issue.

The issue is also enriched by theoretical analyses and experimental data and mathematical methods including the homotopy perturbation method, the variational theory, and it is a good reference not only for thermal science, but also for various communities in mathematics, textile engineering, environmental science, energy, physics, nanotechnology, and chemistry.

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