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责任编辑：张　欣

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Influence of Dust-Containing Bubble Deformation and Interaction on Particle Removal Rate

LIANG Xian, PAN Weitong, CHEN Xueli
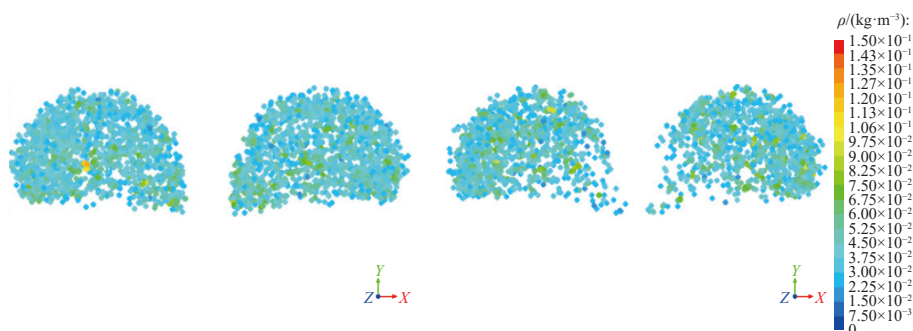
Three-dimensional numerical simulation was performed on the purification process, and the influence of the deformation of dust-containing bubbles and the interaction between the bubbles on the particle removal rate were studied during the rising process. The particle removal mechanism of dust-containing bubbles during the rising process was discussed by analyzing the internal relationship between the dynamic changes of bubbles and particle removal process.

· Materials Science and Engineering ·

Effect of Boron Nitride and Alumina of Different Sizes on Thermal Conductivity of Nylon 6/Polypropylene Composites

SU Fan, ZHANG Ling, LI Chunzhong
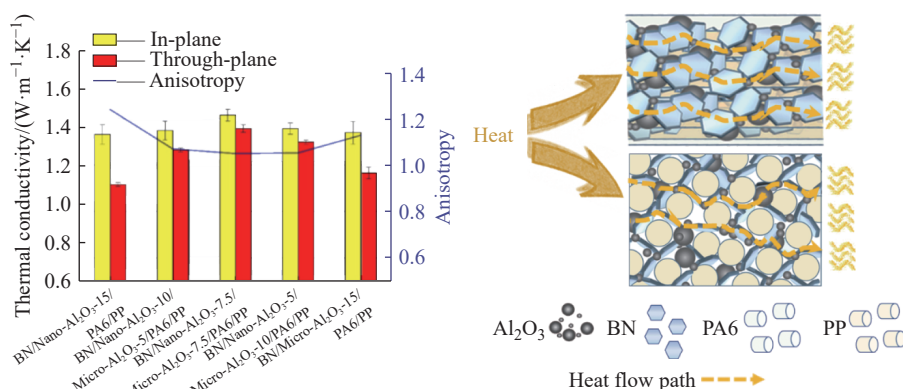
BN sheets and Al_2O_3 balls of different sizes jointly build a continuous thermal conductivity network to improve the in-plane and through-plane thermal conductivity of PA6/PP composites.

Effects of LSPR of Au/Ag Mixed Nanoparticles on the Electroluminescence of White Organic Light Emitting Diode

WANG Husheng, XIE Haifen, MU Haichuan, WANG Ruibin, SHENG Mingyuan

The electroluminescence(EL) performance of the blue light phosphorescent white organic light emitting diode(WOLED) incorporating Au nanoparticles (Au NPs), Ag nanoparticles (Ag NPs) and their mixed nanoparticles of different mixed ratio beneath the PEDOT:PSS hole injection layer(HIL) was investigated, and the surface plasmon-enhanced EL efficiency was demonstrated.
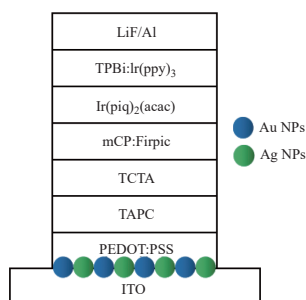
Preparation of Porous SiO₂ Materials from Tobermorite and Their Adsorption Performances

WANG Zhizeng, LI Tong, WANG Dongyun, CUI Xiaoyu, DING Xifeng, CUI Chong

Tobermorite (TOB) was synthesized for the producing of porous silica through selective acid leaching method. The relationship between thermal behavior and acid leaching behavior was studied. After being calcined at 300—700 °C for 2 h, TOB was selectively leached in diluted hydrochloric acid, Ca cations were almost leached, while the silica skeleton was undissolved, forming the amorphous porous silica possessed the morphology similar to TOB particles. The prepared porous silica had a large specific surface area and performed favorable capacity in the adsorption to positively charged dyes such as Safranin T and crystal violet.
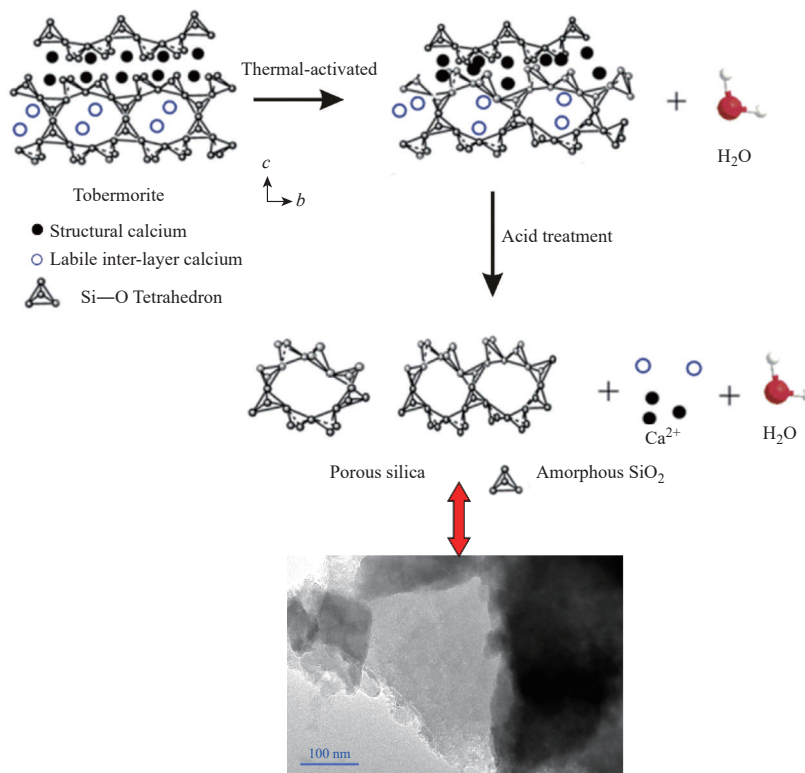
· Bioengineering ·

Optimization of Oxygen Supply Control During the Fermentation of Sophorolipids Synthesis from Alkane as Substrate

LIU Chang, CHEN Yang, TIAN Xiwei, ZHUANG Yingping, CHU Ju, WANG Zejian
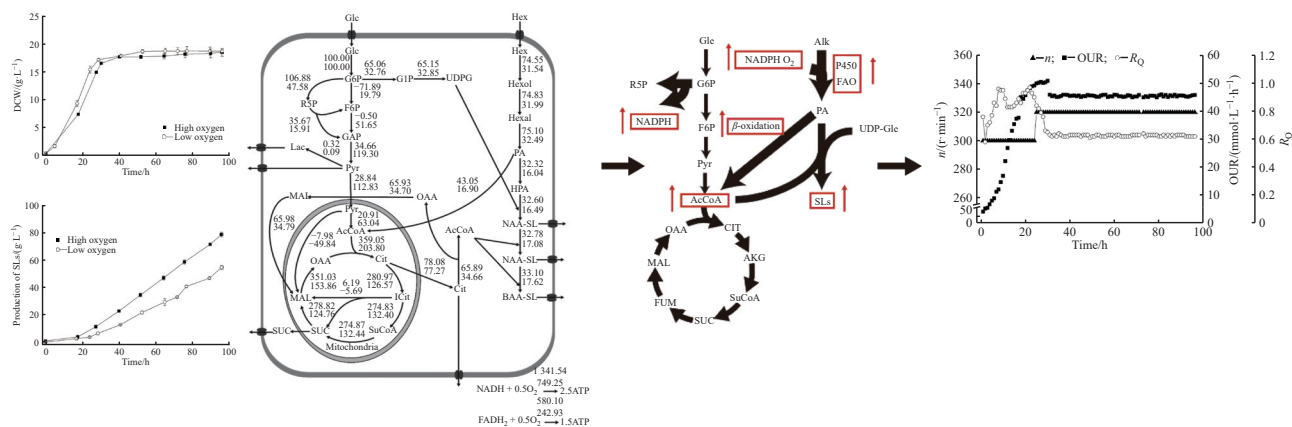
The effects of different oxygen supply levels on SLs synthesis were studied. The oxygen supply level caused significant changes in the utilization of glucose and alkanes. Optimized oxygen supply level was adopted to realize the reasonable distribution of substrates and reduce the power input.

Optimization of Callus Suspension Culture Medium for Enhancing Resveratrol Biosynthesis in *Vitis vinifera* Grape

WANG Xiaohui, WANG Zejian, XIAO Ciying, LIU Zebo, GUO Meijin, ZHUANG Yingping

Journal of East China University of Science and Technology, 2022, 48(2): 203-212.
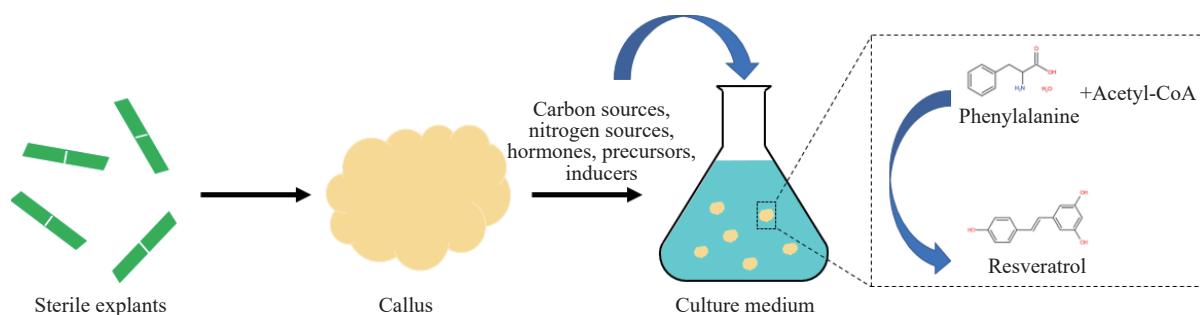
The effects of carbon source, nitrogen source, precursor, inducer and hormone on the cell metabolism of *Vitis vinifera* were investigated by single factor test, Plackett-Burman test and response surface analysis. An optimal nutrient allocation process for the preparation of resveratrol was established and optimized.

Delivery and Cytotoxicity of Type I Shiga Toxin A Subunit by pH-Sensitive Polymer Micelles

SUN Minjia, LIU Yehong, XUE Yitong, XU Jun, WANG Tong, XU Shouhong, ZHANG Junqi

Journal of East China University of Science and Technology, 2022, 48(2): 213-220.
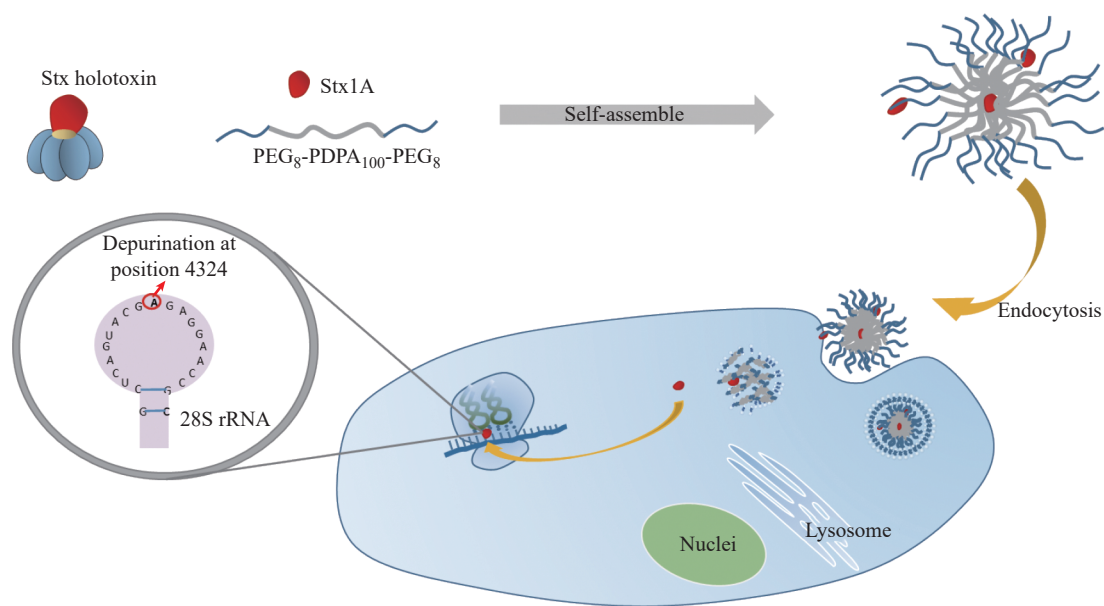
The pH-sensitive polymer micelles were used to target delivery and release of Shiga toxin 1 subunit A (Stx 1A), which inhibited protein synthesis, to Hela cells, and the toxicity of Stx 1A to Hela cells were explored.

Optimal Power Flow Based on Optimization of Wind-Photovoltaic-Storage Hybrid System

LIU Zhonghua, NIU Yugang, JIA Tinggang

Journal of East China University of Science and Technology, 2022, 48(2): 221-230.

The uncertainties of the optimized distributed power generation can be greatly reduced via the implementation of the optimal power flow day-ahead scheduling.

GAN-Based Domain Adaptation Algorithm for Speaker Verification

JI Minfei, CHEN Ning

Journal of East China University of Science and Technology, 2022, 48(2): 231-236.

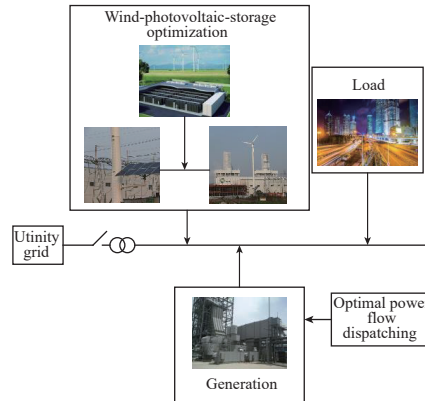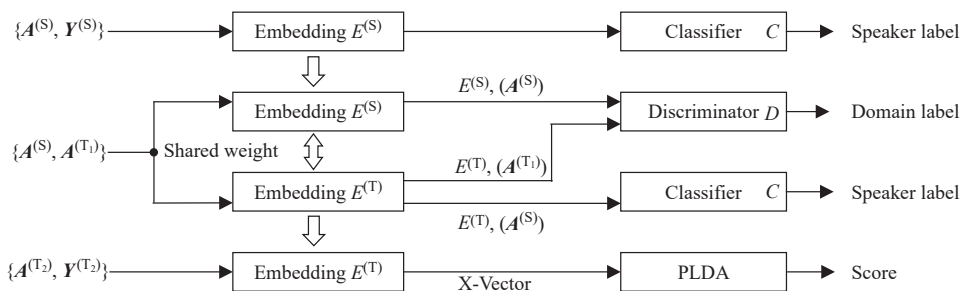An adversarial domain adaptation strategy is designed and applied to the X-Vector-based speaker verification scheme. Its key feature is to make the trained model on a source dataset adaptable for a new target dataset and enhance the model domain adaptation ability.

Design of Delayed PUF Circuit Based on Dynamic Subthreshold

ZHANG Xiaotian, WANG Pengjun, ZHANG Yuejun, ZHANG Huihong

Journal of East China University of Science and Technology, 2022, 48(2): 237-243.

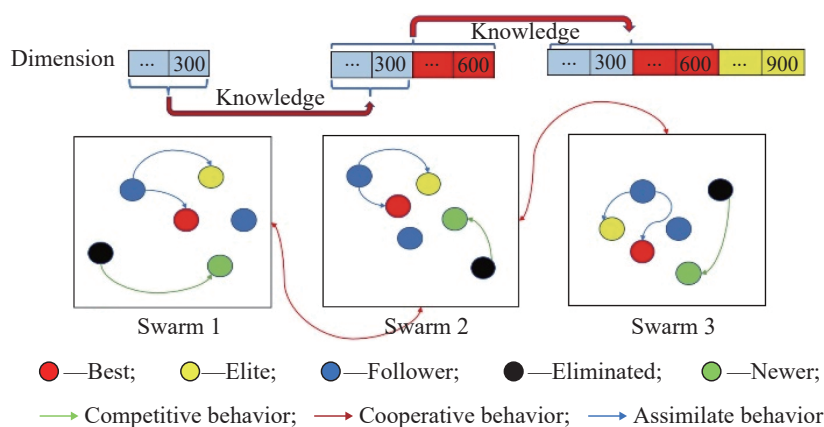In dynamic subthreshold logic, subthreshold characteristics are utilized to form a nonlinear output function, and then, the initial value of the output voltage is modified by charge sharing effect.
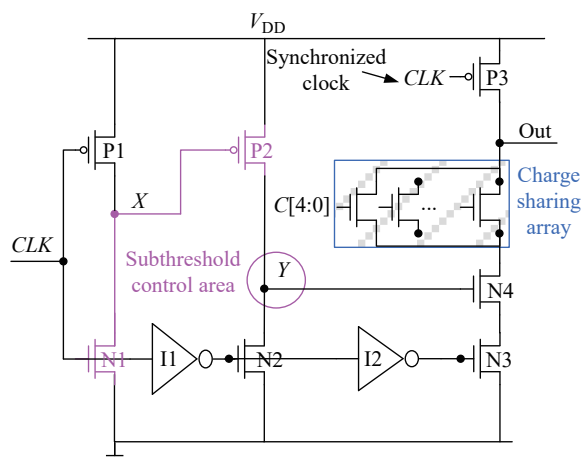
Co-Evolutionary Feature Selection Algorithm Based on Variable-Length Particle and Multi-Behavior Interaction

LI Tengfei, FENG Xiang, YU Huiqun

There are three kinds of behaviors among particles. Eliminator becomes the new particle via the competitive behavior, which can rapidly shorten the distance with the optimal particle. Followers learn from leaders by assimilating behaviors, and leaders adopt cooperative behaviors to transfer knowledge from low-dimensional populations to higher-dimensional populations.

Curriculum Evaluation System Based on Association Rules and Cluster Analysis

FAN Shengfa, ZHANG Xianmei, YU Huiqun

Course name	Discrete mathematics					
Evaluation year	2018		Teaching class		××××	
Graduation requirement index points	1.2	Target value of achievement degree	0.3	Evaluation valule		…
Student number	Name	Test paper		0.5	Homework	0.3	Experiment	0.2
		Question 1	Question 2	…	Work 1	Work 1	Experiment 1	…
		20	20	…	25	10	15	…
1017××××	×××	…	…		…			
1017××××	×××	…	…		…			
Average score	…			…			
Full score	…			…			

Through detailed and classified records of the examination, homework and related experimental results of Discrete Mathematics, the achievement degree required by graduation is calculated, so as to quickly generate the report required for engineering certification, saving a lot of manpower and time.

Optimization of Polyimide Cutting Parameters Based on Finite Element Simulation

ZHANG Hang, LEI Xuelin, HE Yun, LI Zixuan

Journal of East China University of Science and Technology, 2022, 48(2): 265-272.
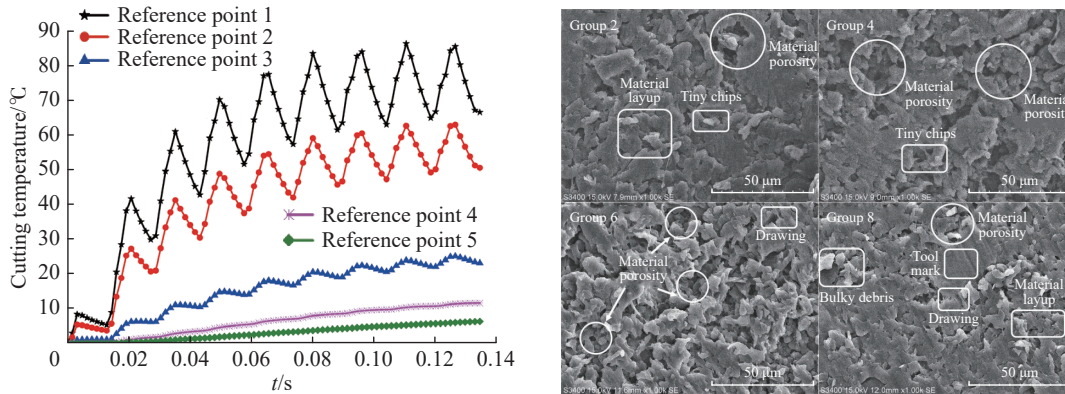
A method of constructing polyimide constitutive model through VUMAT subroutine in finite element analysis software is introduced. The optimal cutting process parameters of porous polyimide materials were explored through milling simulation experiments, and compared with cutting experiments for verification.

Outdoor Navigation Method of Mobile Robot Based on Model Predictive Control

GUO Mingyang, LIU Shuang

Journal of East China University of Science and Technology, 2022, 48(2): 273-280.

A stable and effective outdoor navigation method of mobile robot based on model predictive control was reported. The robot constructs local grid map in real time according to the surrounding environment. An improved A-star algorithm based on the road direction was used to search the local obstacle avoidance path and a differential robot model predictive controller was designed to track the trajectory.