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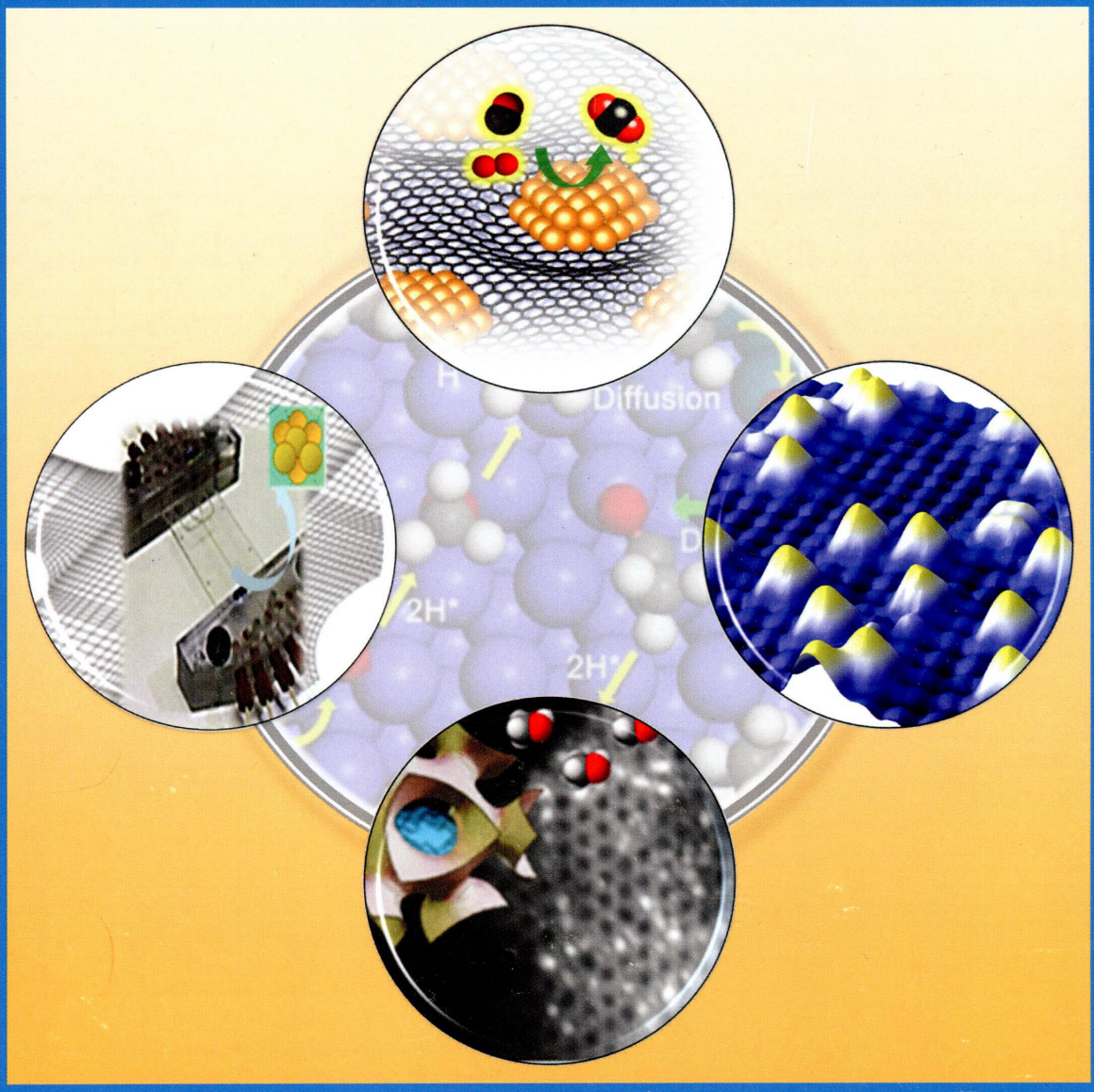

Synthesis, Characterization, and Computation—Working Together
(see page 20043)

ENERGY CONVERSION AND STORAGE, OPTICAL AND ELECTRONIC DEVICES, INTERFACES, NANOMATERIALS, AND HARD MATTER

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ON THE COVER: Synthesis, characterization, and computation—working together. Top: Catalysis by arrays of metal nanoclusters that are formed on corrugated thin film surfaces. Right: Atomically resolved scanning tunneling microscopy image of single gold atoms supported on a model catalyst. The atoms are thermally stable and stay dispersed up to temperatures of 700 K. Bottom: This image shows pore-confined metal nanoparticles on $CuZnO/SiO_2$ methanol synthesis catalysts. Reprinted with permission from: Prieto, G.; Shakeri, M.; de Jong, K.P.; de Jongh, P.E. Quantitative Relationship between Support Porosity and the Stability of Pore-Confined Metal Nanoparticles Studied on $CuZnO/SiO_2$ Methanol Synthesis Catalysts. ACS Nano **2014**, *8*, 2522–2531. Left: Geometric optimization of liquid–liquid slug flow in a flow-focusing millifluidic device for synthesis of nanomaterials. Adapted with permission from Elsevier: Li, Y.; Yamane, D. G.; Li, S.; Biswas, S.; Reddy, R. K.; Goettert, J. S.; Nandakumar, K.; Kumar, C. S. S. R. Geometric Optimization of Liquid–Liquid Slug Flow in a Flow-Focusing Millifluidic Device for Synthesis of Nanomaterials. *Chem. Eng. J.* **2013**, *217*, 447–459. Center: Computationally derived reaction mechanism for the conversion of syngas to ethanol on a cobalt–palladium nanocluster catalyst. Higher alcohols are formed only when short alkane fragments diffuse from highly active cobalt sites to Co–Pd interface sites capable of catalyzing CO insertion reactions. See page 20043.

Feature Article

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