

Research Work Title

Phase Engineering of Nanomaterials



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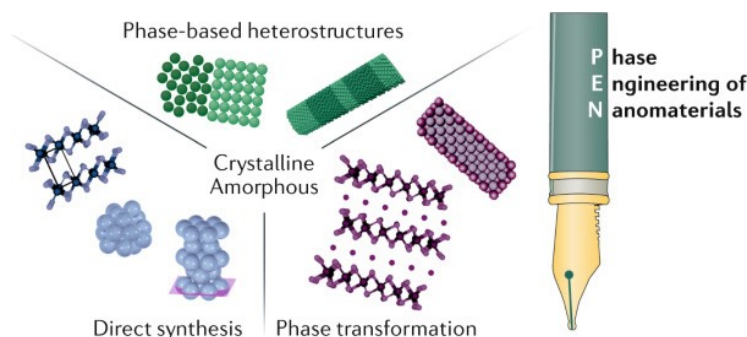
Country | The People's Republic of China

Field | Nanotechnology

Scientific Affiliation | City University of Hong Kong

Abstract

This research mainly focuses on phase engineering of nanomaterials (PEN), i.e., the rational design and synthesis of novel nanomaterials with unconventional phases for investigation of phase-dependent physicochemical properties and applications in catalysis, (opto-)electronic devices, clean energy, etc. The research on PEN is very important not only in fundamental studies but also in future practical applications. For example, we prepared novel Au nanostructures (e.g., the hexagonal-close packed (hcp) 2H-Au nanosheets, 4H-Au nanoribbons, 4H/fcc and fcc/2H/fcc heterophase Au nanorods), epitaxially grown metal nanostructures on the aforementioned unconventional Au nanostructures, 2H-Pd nanoparticles, and amorphous/crystalline heterophase Pd, PdCu, Rh, and Rh alloy nanosheets successfully. In addition, metastable 1T'-phase group VI transition metal dichalcogenides (TMDs), e.g., WS_2 , WSe_2 , MoS_2 , $MoSe_2$, $WS_2xSe_{2(1-x)}$ and $MoS_2xSe_{2(1-x)}$ were prepared and the phase transformation of TMDs during our developed electrochemical Li-intercalation process was observed. Impressively, the lithiation-induced amorphization of $Pd_3P_2S_8$ was achieved.



Biography

Prof. Hua Zhang obtained his B.S. and M.S. degrees at Nanjing University in 1992 and 1995, respectively, and completed his Ph.D. at Peking University in 1998. After doing postdoctoral research, he joined Nanyang Technological University in 2006. Prof. Zhang moved to the City University of Hong Kong in 2019, and at present, he is the Herman Hu Chair Professor of Nanomaterials. He was listed in the "Highly Cited Researchers" (2014-2022) and "Hottest Researchers of Today" (2014-2015, Clarivate Analytics/Thomson Reuters). His awards and honors include Foreign Fellow of the European Academy of Sciences, Vice-Chancellor's International Scholar Award (University of Wollongong), ACS Nano Lectureship Award, World Cultural Council (WCC) Special Recognition Award, etc.