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Editorial

Editorial: Core–Shell Nanostructures for Energy Storage and Conversion

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Owing to their special physical and chemical properties, nanomaterials with core–shell structures have been extensively synthesized and widely studied in the field of energy storage and conversion. The goal of energy storage and conversion will be facilitated by designing and fabricating core–shell structural nanocomposites that possess many promising virtues. For instance, the shell supported by the core guarantees the specific surface architecture relying on the porosity, surface area, etc., resulting in outstanding electrochemical performance. Moreover, the synergistic interactions between the shell and core are beneficial to realize advanced electrochemical properties.

Here, we hope that recent developments in the research of various types of core–shell structure nanomaterials in the field of energy storage and conversion will be communicated well in this Special Issue. This Special Issue comprises five articles. McVey et al. synthesized a core–shell Cd_3P_2/Zn_3P_2 composite and studied its structural (morphology, crystallinity, shell diameter), chemical (composition of core, shell, and ligand sphere), and optical properties (absorbance, steady-state and time-resolved emission, quantum yield, and air stability) [1]. Shi et al. prepared a MOF-derived NiSe@C composite exhibiting excellent sodium-ion storage properties [2]. Song et al. fabricated a $Ni_2P@Fe_2P$ core–shell nanostructure with outperforming OER performance through the chemical transformation of rationally designed Ni-MOF composite nanosheets [3]. Song et al. fabricated a unique core–shell structure integrating $CoMoO_4$ as support frameworks coated with 2D γ-FeOOH nanosheets on the surface. By involving $CoMoO_4$, the electrochemically active surface area can be significantly enhanced [4]. Hwang et al. prepared Si@C nanoparticles through a solvent-assisted wet coating method, achieving excellent specific capacity and capacity retention [5].

This Special Issue will promote developments and innovative ideas through fruitful discussions among researchers in the field of nanomaterials and energy.

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References

1. McVey, B.F.P.; Swain, R.A.; Lagarde, D.; Ojo, W.-S.; Bakkouche, K.; Marcelot, C.; Warot, B.; Tison, Y.; Martinez, H.; Chaudret, B.; et al. Cd_3P_2/Zn_3P_2 Core-Shell Nanocrystals: Synthesis and Optical Properties. *Nanomaterials* **2022**, *12*, 3364. [CrossRef] [PubMed]
2. Shi, X.Y.; Fang, L.J.; Peng Deng, H.D.; Deng, X.Z.; Sun, Z.P. Metal-Organic Framework-Derived NiSe Embedded into a Porous Multi-Heteroatom Self-Doped Carbon Matrix as a Promising Anode for Sodium-Ion Battery. *Nanomaterials* **2022**, *12*, 3345. [CrossRef] [PubMed]
3. Song, H.J.; Li, J.J.; Sheng, G.; Yin, R.L.; Fang, Y.H.; Zhong, S.G.; Luo, J.; Wang, Z.; Mohamad, A.A.; Shao, W. Chemical Transformation Induced Core–Shell $Ni_2P@Fe_2P$ Heterostructures toward Efficient Electrocatalytic Oxygen Ovolution. *Nanomaterials* **2022**, *12*, 3153. [CrossRef] [PubMed]
4. Song, H.J.; Li, J.J.; Sheng, G.; Yin, R.L.; Mohamad, A.A.; Luo, J.; Zhong, Z.N.; Shao, W. Construction of Core–Shell $CoMoO_4@\gamma$-FeOOH Nanosheets for Efficient Oxygen Evolution Reaction. *Nanomaterials* **2022**, *12*, 2215. [CrossRef] [PubMed]
5. Hwang, J.H.; Jung, M.; Park, J.J.; Kim, E.K.; Lee, G.; Lee, K.J.; Choi, J.H.; Song, W.J. Preparation and Electrochemical Characterization of Si@C Nanoparticles as an Anode Material for Lithium-Ion Batteries via Solvent-Assisted Wet Coating Process. *Nanomaterials* **2022**, *12*, 1649. [CrossRef] [PubMed]