

Ionic liquid-based materials: Teach an old dog new tricks

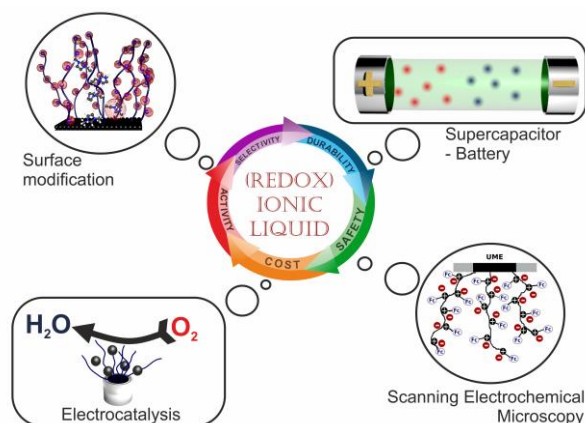
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Increasing demand of energy and exhaustion of fossil fuel require massive investment for exploration and utilization of sustainable energy. However, due to the intermittence of the current renewable sources, the generated electricity must be stored under other forms to correlate the fleeting production and the continuous consumption. Despite available commercialized systems, seeking for new materials and new approaches for resolving this problem is

still matter of interest for scientific researches. Consequently, tailoring the physical-chemical properties at the molecular scale becomes crucial not only for boosting the activities of the existing materials but also for creating a new type of molecular entities for storing and releasing the energy.

Following this concept, an old discovery of ionic liquid has been recalled. Bearing charges at the natural state, the ionic liquid becomes one of the best candidates for resolving the energetic problems. This family of compounds is nowadays upcoming major research field by offering their relevant capabilities. In this context, our work is based on the knowhow in surface functionalization and material preparation by simple methods to build up highly efficient and cost-effective electrochemical systems that can be used in various applications. Interestingly, an infinity of ionic liquids can be obtained resulting from the possibility to tune the physical-chemical properties at molecular level. Moreover, the combination of simple ionic liquid with electrochemical active groups leads to the formation of promising multifunctional molecules, redox-active ionic liquids, that have been demonstrated to be suitable for energy storage.

Short Bibliography

Thuan-Nguyen Pham-Truong obtained his PhD in November 2018 at Université Paris Diderot. Then, he moved to Bard's group at University of Texas at Austin as an NSF postdoctoral fellow. From September 2019, he becomes Maître de Conférences at Cergy – Pontoise University. His current research interest includes the development of functional materials for energy and environmental driven applications.

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