

Late transition metal nanocomplexes: Applications for renewable energy conversion and storage

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ABSTRACT

Energy conversion is one of the keys to the world's future renewable and sustainable energy infrastructure systems. The use of multidimensional late transition metal complexes-based nanostructures to realise the self-powered or energy-autonomous systems have led to the creation of mechanistic-catalytic synergies of materials functions. The system requires enhance interface architectures to recover and revolutionise those valuable materials-based resources. Hence, the purpose of the present work is to highlight the importance and the current progress of these latest generations of late transition metal nanocomplexes as a material source in renewable energy structure development. This paper reviews the fundamental mechanism steps in catalytic reactions with the focus of attention limited to the characteristic features of these late transition metals. Further on this, the developments in the field of self-powered of the late transition metal nanocomplexes, mainly focusing on their electrocatalytic reactions for energy conversion technology, comprises ORR, OER, and HER is reviewed. This is followed by a discussion on the current demand for the past five years in high-capacity renewable energy storage applications. Through the discussions, the optimisation and evolutionary changes in terms of selection, stability and scalability of late transition metal nanocomplexes are the factors that make them as a leader to suit the current energy landscape and for the next 25 years for prosperous, sustainable and affordable global energy future. This review will complement other papers on the energy transformation processes and storage that involve modern micro and nanotechnology, thus further boosting the over-all specific properties of transition metal complexes -based nanostructures.

KEYWORDS

Late transition metal nanostructures; Energy conversion; Energy storage; HER; OER; ORR

ACKNOWLEDGEMENTS

The author would like to acknowledge the support of the internal grants of Universiti Malaysia Pahang RDU190360, PGRS200312 and PGRS1903179.