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# Advancements in silica-based nanostructured photocatalysts for efficient hydrogen generation from water splitting

B.A. Abdulkadir<sup>a,b</sup>, L.P. Teh<sup>c</sup>, S.Z. Abidin<sup>a,b</sup>, H.D. Setiabudi<sup>a,b,\*</sup>,  
R. Jusoh<sup>b,\*\*</sup>

<sup>a</sup> Centre for Research in Advanced Fluid & Processes, Universiti Malaysia Pahang Al-Sultan Abdullah, Lebu  
Persiaran Tun Khalil Yaakob, Gambang, Kuantan 26300, Pahang, Malaysia

<sup>b</sup> Faculty of Chemical and Process Engineering Technology, Universiti Malaysia Pahang Al-Sultan Abdullah, Lebu  
Persiaran Tun Khalil Yaakob, Gambang, Kuantan 26300, Pahang, Malaysia

<sup>c</sup> Department of Chemical Sciences, Faculty of Science and Technology, Universiti Kebangsaan Malaysia, UKM,  
43600 Bangi, Selangor, Malaysia

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## ABSTRACT

The development of effective catalysts, particularly silica-based nanostructured photocatalysts for hydrogen production via water splitting, has recently appeared as a research flashpoint. Although much progress has been made, basic issues are yet to be resolved to understand the relationship between the photocatalyst properties and the photocatalytic performance of silica-based nanostructured materials. Additionally, no article critically discusses the relationship of structures, types, properties, and metal-support interaction on photocatalytic performance. Therefore, this article provides an in-depth review of the recent advancements in silica-based nanostructured photocatalysts covering photocatalyst preparation methods and governing factors affecting hydrogen production. The role of metals, sacrificial reagents, supports, and metal-support interfaces in enhancing hydrogen production was comprehensively reviewed. Moreover, future prospects and opportunities for hydrogen production via water-splitting were also discussed. This article is anticipated to serve as an eye-opening point for future researchers interested in the creation of silica-based photocatalysts.

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\* Corresponding author at: Centre for Research in Advanced Fluid & Processes, Universiti Malaysia Pahang Al-Sultan Abdullah, Lebu  
Persiaran Tun Khalil Yaakob, Gambang, Kuantan 26300, Pahang, Malaysia.

\*\* Corresponding author.

E-mail addresses: [herma@ump.edu.my](mailto:herma@ump.edu.my) (H.D. Setiabudi), [rohayu@ump.edu.my](mailto:rohayu@ump.edu.my) (R. Jusoh).

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