Active role of C_3N_4, and CQD for photocatalytic water purification, an overview

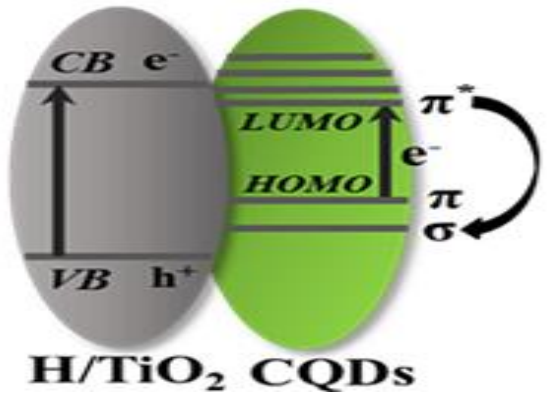
Wilfried Wunderlich[a]

[a] Department of Material Science, Faculty of Engineering, Tokai University, Japan

1. Abstract

Photocatalytic materials used for water purification have improved over the last decades, as their important parameters for performance, such as nanometer size, high absorption factor, slow recombination rate, high carrier concentration, p/n- junction and high carrier mobility were optimized. Carbon Quantum dots (GQD) and graphitic Carbon nitrites (g-C_3N_4) [1] are used in combination with metallic or semi-conducting nanoparticles such as Ag, Pd, TiO_2 [2], ZnO. The best performance is 100% degradation of dyes within less than 10 min [3-5]. In 2020 the amount of literature has increased dramatically, and in this overview presentation we provide guidelines for new experiments and applications together with our own experience [7]. CNT and C_3N_4 are the ideal materials because they have sufficient mechanical and thermal stability to act as a scaffold, but CQD and C_3N_4 also participate actively in improvement of band gap type I (fig. 1) [2] or the Z-Scheme.

II. Image



Bandgap of TiO_2 and CQD Nano-composites [2].

III. References

1. 10.1063/1.5143819
2. 10.1021/acsami.9b04059
3. 10.1016/j.cej.2020.126509
4. 10.1016/j.apcatb.2020.119349
5. 10.1016/j.cej.2019.05.028
6. 10.1021/acs.jpcc.8b08788

IV. Biography:

Wilfried Wunderlich has completed his PhD in 1987 from Max-Planck Institute for Metal Research, Stuttgart and University of Stuttgart (Germany). He is full professor for material science at Tokai University since 2006. He has published more than 140 papers in reputed journals and is serving as an experienced referee for several journals.

V. Presenting author details



Full name: Wilfried Wunderlich
Organization/Institute/ Company,
Department of Material Science, Faculty of Engineering, Tokai University,
Country: Japan
Email: wi-wunder@rocketmail.com
Mobile: +81-90-7436-0253
ORCID iD
http://orcid.org/0000-0003-4354-4801