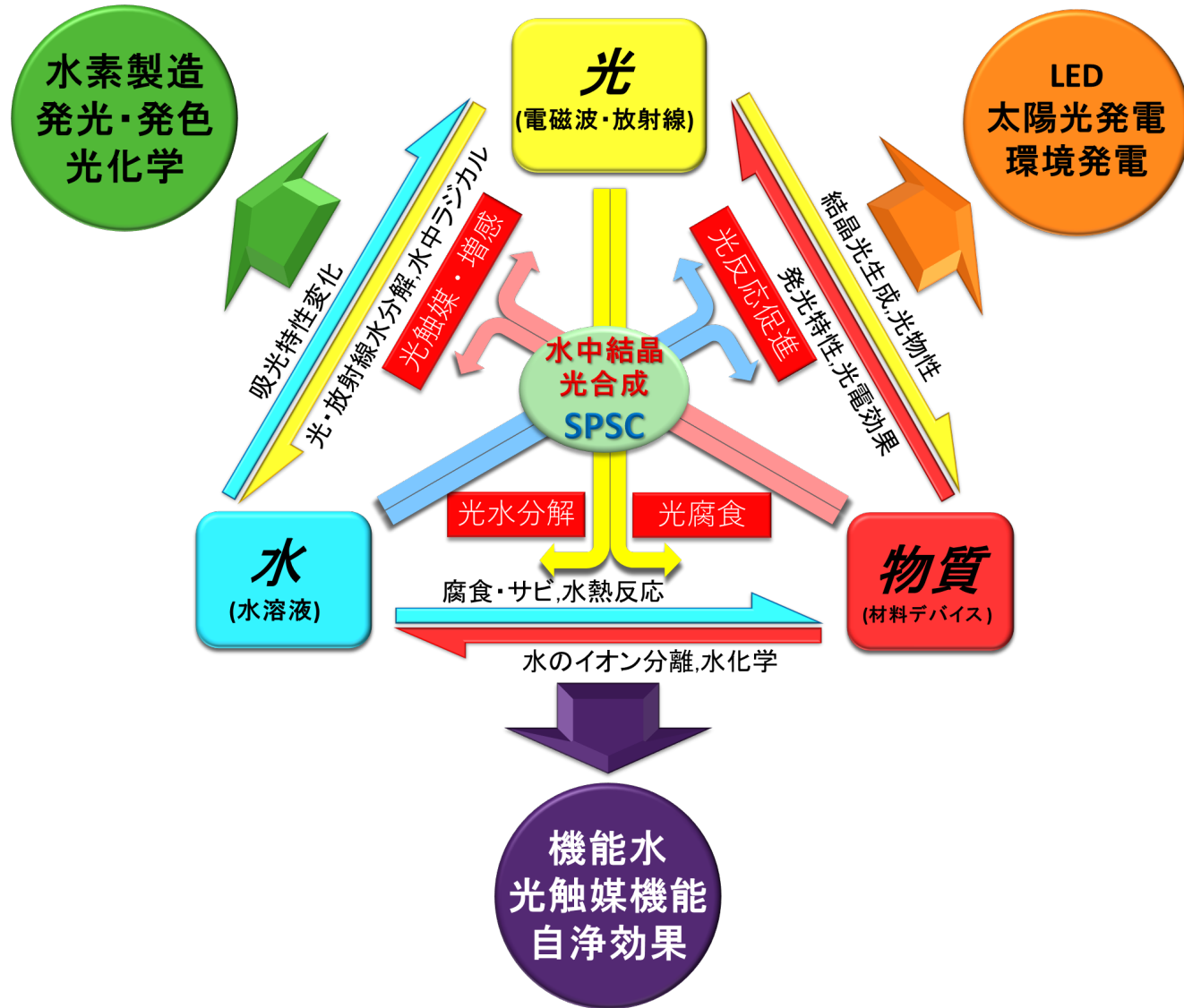


SPSC(Submerged-Photo-Synthesis-of-Crystallites)

光・水・物質の相互作用



グリーンケミストリー環境・水化学
【(太陽)光利用材料化学】

- ・光触媒効果【有機物合成, 水分解, 超撥水】
- ・光分解, 光重合
- ・水ラジカル化学(放射線水化学)
- ・人工光合成
- ・環境水浄化
- ・その他, 環境指標

グリーンエネルギー【光水素製造】
エネルギー 【光ガルバニ電池】

- ・再生可能エネルギー創生
- ・水素エネルギー製造
- ・太陽エネルギー利用
- ・光エネルギー変換
- ・その他, エネルギー材料

水中結晶光合成: SPSCの研究ターゲット

グリーンテクノロジーのための光材料科学

グリーンナノテク【結晶光合成】
2D-3Dヘテロナノ構造

- ・ナノフラワー
- ・ナノプレート
- ・ナノロッド
- ・ナノボール

その他, 低次元構造ナノ粒子

光学デバイス創製【水中光電析】

- ・発光デバイス
- ・光電デバイス
- ・光磁気デバイス
- ・光吸収体
- ・光導電体
- ・ワイドギャップ半導体
- ・その他LED, レーザー応用など

A bit of history on SPSC

SPSC: ultra-pure water

2015-Single metal oxides: Nano flowers, Nanorods

ZnO[1,2,3,5], CuO[4], FeOOH[8], WO₃ [12], e-TiO₂[16]

Galvanic-SPSC

2019-Hetero structures: Nanorods@metal surfaces

ZnO@Cu, Ni, Ag, Au, Pt, W [6,7,9] , CuO@Au[9]

2020- Water splitting related

Aqua-ion splitting [10], Solar-water evaporation [11]

2022- 3D Heterostructures: Hetero-Semiconductors

ZnO-NRs@CuO-NW[14,18], ZnO-NRs@Si[15],

ROS-SPSC

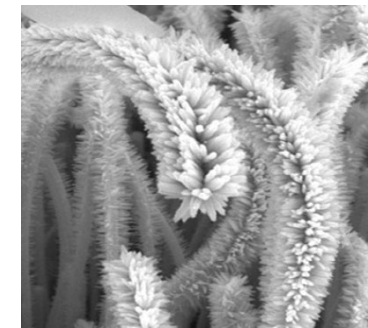
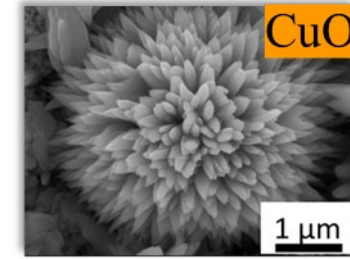
2023- Multi-Component MC-SPSC:

Doping: Fe,Cu,Co,Mo-WO₃ · nH₂O[13,17,19], *Fe-MO₃*

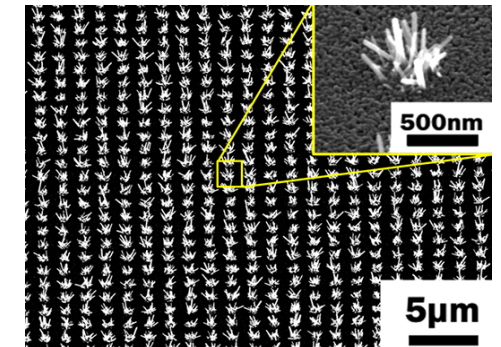
Hetero-nano-oxides: TiO₂-WO₃, CuO-WO₃

SPSC-Methanation (for CH₃, H₂ generation)

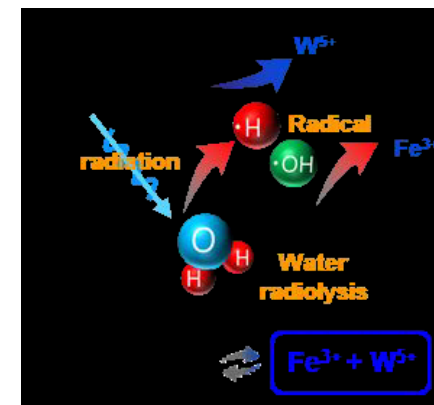
2023- PhotoSabatier: *FeCO₃.&Zn, Mg etc*



ZnO/CuO nano-forest



ZnO-NRs@Si patterned



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