



ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

ORGANIZZATO DA



Bologna: un hub di ricerca per lo sviluppo
dell'idrogeno - 9 ottobre 2024

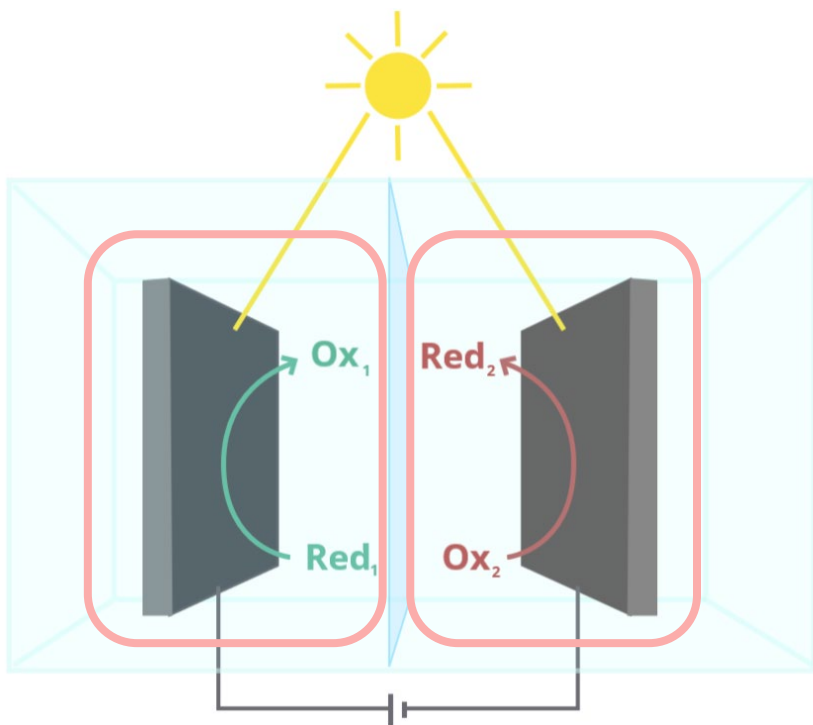
CuInS₂ quantum dots as photoanodic materials in photoelectrochemical cells (PEC)

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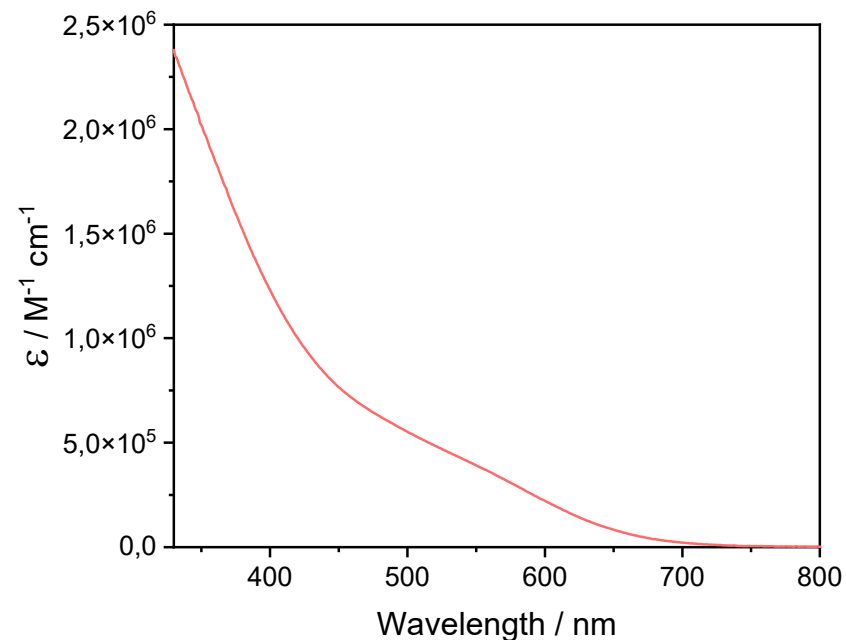
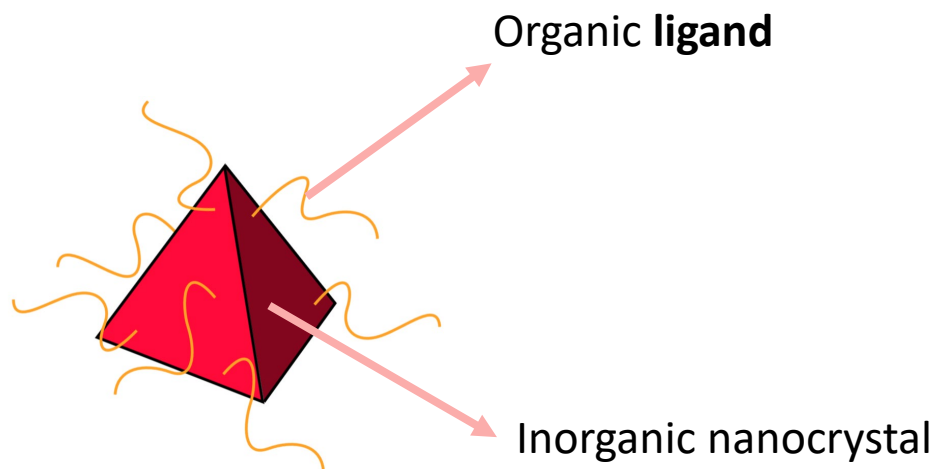
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Photoelectrochemical cells



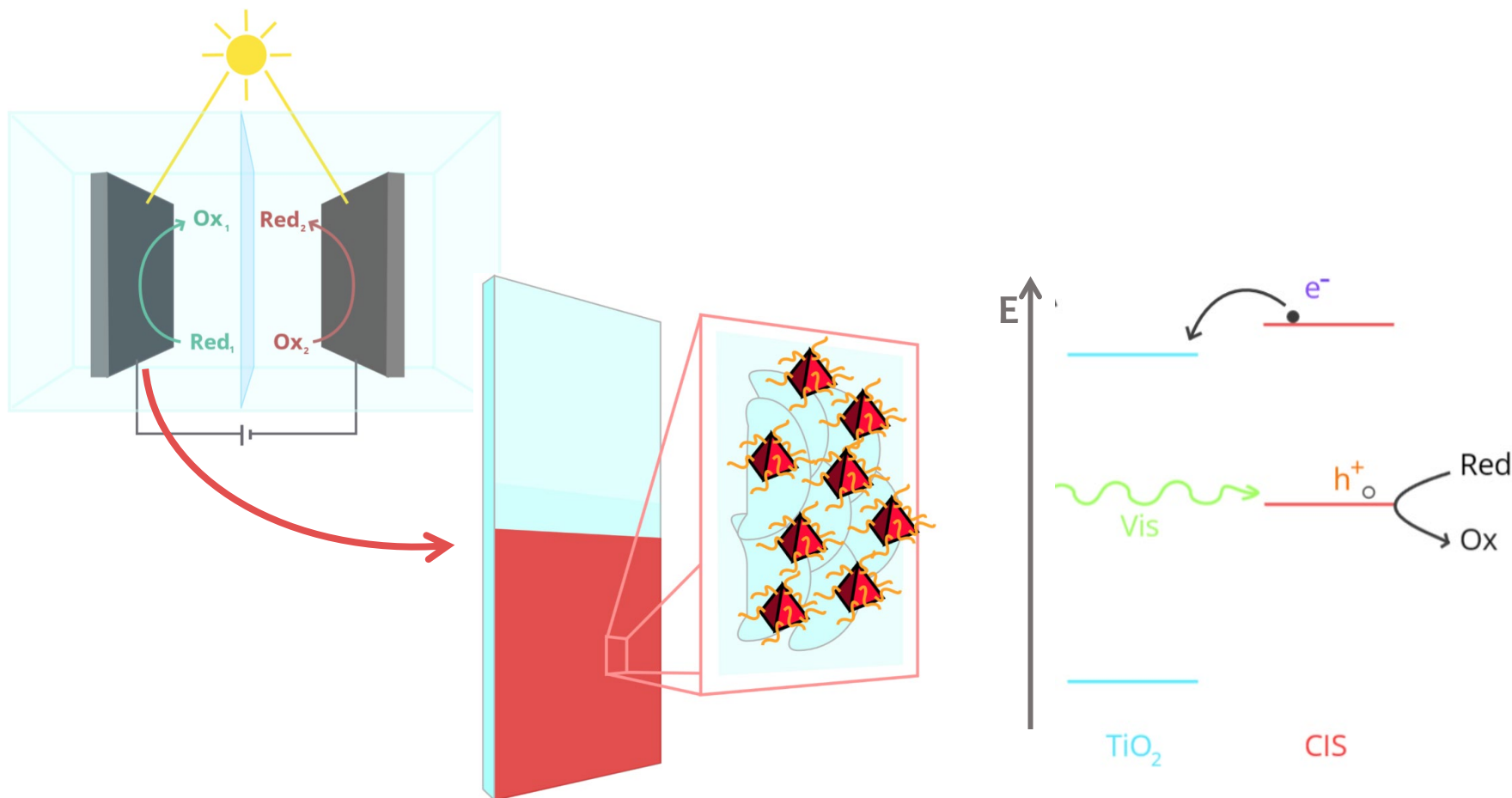
- ❑ Employing **solar energy** together with an **electrical bias** to promote redox reactions
- ❑ Solar fuel production
 - ❑ Hydrogen formation
 - ❑ Carbon dioxide reduction
- ❑ Organic **photoelectrosynthesis**
 - ❑ Biomass oxidation
 - ❑ Other substrate's oxidation

CuInS₂ quantum dots



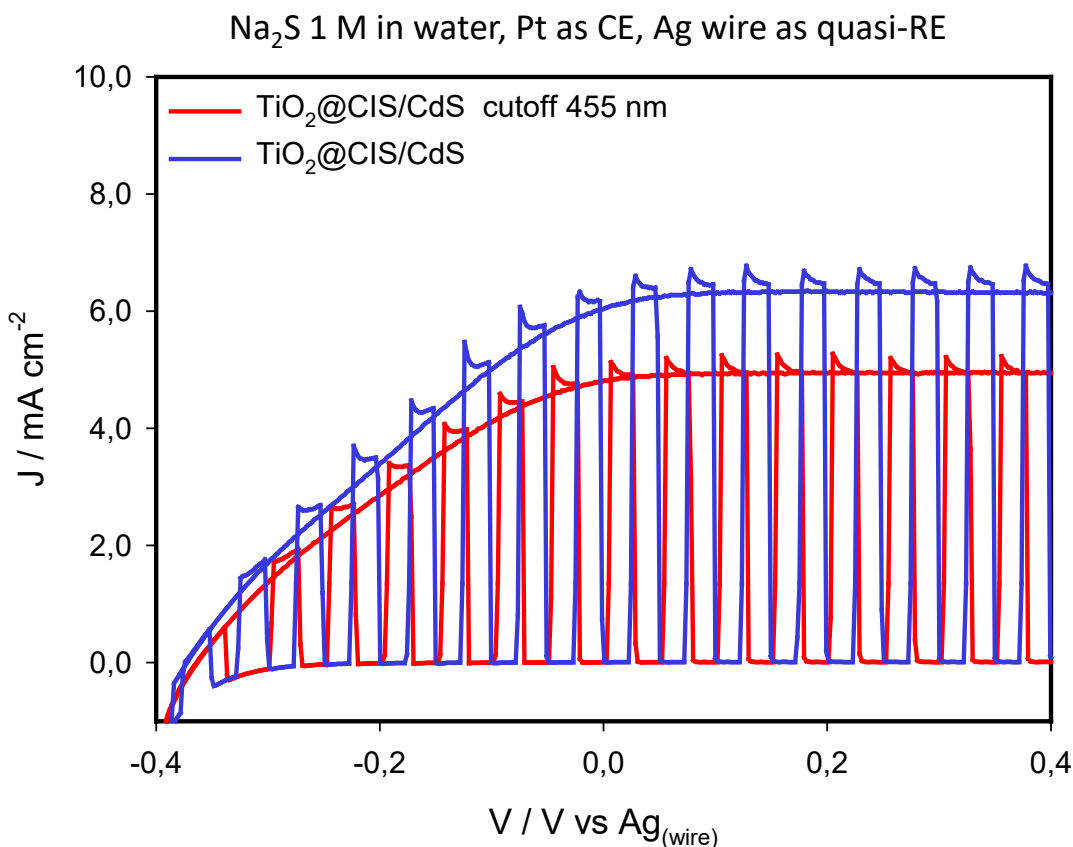
- ❑ Highly **tunable** optical properties
- ❑ **Direct band-gap** → high molar absorption coefficients
- ❑ **Heavy metal-free**

QD-sensitised photoelectrochemical cells



Adv. Optical Mater. 2024, 12, 2400259

QD-sensitised photoelectrochemical cells



Na₂S – Sacrificial donor for PEC

Under **1-sun equivalent illumination**, photocurrents reach **6 mA/cm²**

Stable under cycling – the plateau current is not changing.

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