

## סמינר כימיה פיסיקלית ואנליטית

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נושא:

## COLLOIDAL NANOPARTICLE BASED PHOTOCATHODES FOR SOLAR DRIVEN HYDROGEN EVOLUTION REACTION

This research was performed under the supervision of  
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ההרצאה תתקיים בחדר הסמינרים הפקולטי



## Colloidal nanoparticle based photocathodes for solar driven hydrogen evolution reaction

Solar-driven water splitting into hydrogen and oxygen can provide a source of clean and renewable fuel. However, systems that are sufficiently stable and efficient for practical use have not been realized yet. Two approaches have been developed for the design of artificial photosynthesis devices: photocatalysis via molecular or semiconductor particle-based species dispersed in solution, and photoelectrochemical (PEC) cells. Each approach offers different advantages, alongside some disadvantages. In the course of the work presented we strived to combine the two methods and harness the high degree of control over material characteristics that is offered by colloidal photocatalyst synthesis to benefit the construction of an improved PEC device.

In particular, we prepared and characterized photocathodes for light driven hydrogen evolution from water, constructed of CdSe@CdS seeded rods that are deposited on porous p-type NiO substrate. In this seminar, I will present and discuss the effect of different parameters, such as substrate morphology, sensitizer-substrate linking molecules and metal co-catalyst deposition, on the device's performance.

