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Title of Presentation: Microfluidics for artificial photosynthesis of carbohydrates

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Abstract:

Recent years have witnessed a rapid increase of research interest in the photocatalysis technology that focuses on the conversion of solar energy into chemical energy. Our group has explored the microfluidics technology to significantly improve the efficiency of photocatalytic reactions [1,2]. Recently, we have proposed to generate glucose using CO₂ and sunlight by mimicking the natural photosynthesis, and have found that the optofluidic structures enable to cascade various steps of photosynthetic reactions while avoiding the common problems like enzyme deactivation, oxygen toxication, etc. New one-step fabrication method of artificial photosystem I (PSI) has also been developed using g-C₃N₄ and M. It shows an enhancement of the reaction speed by 23 times as compared to the control (here the bulk g-C₃N₄-slurry system) [3]. In conclusion, the optofluidics technology helps overcome the old problems of photocatalysis and enable new functionalities of photosynthesis.

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