# Passive solar steam generation for environmental remediation and $H_2$ production

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**Abstract**

Solar-to-steam generation (SSG) is emerging green technology which could be applied for many environmental and energy applications. The concept of solar photothermal water evaporators is based on the accelerated heating of the air–water interface (excluding bulk water) using floating materials that can effectively convert the solar light into heat. In this approach, the engineering of materials and systems are key determinants for enhanced photothermal conversion and water evaporation under daily solar light. In this talk, we will discuss the mechanisms SSG and controlling factors to boost the localization of heat and steam generation. The application of SSG for seawater desalination and H2 generation will be addressed by showing case studies from our research activities. The importance of SSG configuration and used photothermal nanomaterials to solve common issues or/and to boost the performance will be stressed and clarified.

**Keywords:** Solar-to-steam generation; Solar desalination; $H_2$ generation; Energy transition; Circular economy.

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