Solar thermal power generation absorber

What is a solar selective absorber?
Solar selective absorbers (SSAs) possess high sunlight absorption(300-2500 nm) and low infrared thermal radiative losses (2.5-25 mm),which are undoubtedly the best choice for photothermal conversion process,and SSAs have been widely used in concentrating solar power,solar water heating,and solar drying.

What is a solar absorber?
Solar absorbers,which convert solar radiation into heat,are a key component to the performance of various solar thermal systems,such as solar thermal power plants and solar thermoelectric generators,as well as solar thermophotovoltaics.

Which solar selective absorber is best for photothermal conversion?
Solar selective absorbers (SSAs) with high absorption and low emissionare better choice for photothermal conversion,which is the key component of solar thermal conversion systems. [4,8 - 11]The two important optical parameters of SSAs,absorptance (a ¯) and emittance (e ¯),are defined as follows [12]

What makes a good solar-thermal absorber?
Therefore,from the ideal solar-thermal absorber design point of view,selective and almost total absorption across the entire solar spectrum,flexible tunability of the cut-off wavelength,and minimized excessive energy dissipation by thermal radiation in the near-IR (NIR) to mid-IR range are the essential factors.

What is the synergy of composite/hybrid solar selective absorbers with photothermal devices?
In addition,the synergy of composite/hybrid solar selective absorbers with photothermal devices is important for functionalization and performance enhancement. For example,a solar selective absorber combining spectrally selective and superhydrophobicity can be used for photothermal deicing and personal thermal management textile.

Can a spectrally selective absorber increase solar-thermal conversion efficiency?
However,it is a grand challenge but essential to increase solar-thermal conversion efficiency. A spectrally selective absorber,which is capable of boosting solar absorptance (a) while suppressing thermal emittance (e),shows great potentialto elevate the solar-thermal conversion efficiency.

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In comparison with the expensive chemical energy storage (mainly batteries) typically applied to wind and solar photovoltaic power stations, the TES-based CSP plant has a great benefit in long-term energy storage with low cost. 1-3 ...

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