LIGHT DRIVEN WATER SPLITTING DEVICE FOR SOLAR HYDROGEN GENERATION AND METHOD FOR FABRICATING THE SAME

SUMMARY

The invention refers to a light driven water splitting device for solar hydrogen generation comprising an InN/InGaN quantum nanostructure photoanode monolithically integrated with a Silicon photovoltaic cell placed together with a counter electrode in an aqueous electrolyte solution. The photoanode absorbs in the visible spectral range of solar radiation where the photon energy is large enough to drive the water splitting reaction while the Si solar cell extends the absorbtion to the near infrared. The contact between the photoanode and the solar cell is ohminc such that the solar cell operates as an additional internal bias for the photoanode without losses. This enhances the solar to hydrogen efficiency of the photoanode which already has an efficiency of 6% at zero external bias to an eocnomically viable value above 10% with a targeted efficiency around 20%.

KEY POINTS / ADVANTAGES

- The invention is an innovative photoelectrochemical device comprising the integration of an InN/InGaN quantum nanostructure photoanode with a Silicon photovoltaic cell producing, with a counter electrode, hydrogen and oxygen gas with improved efficiency
- Si photovoltaic cell within a fotochemical cell forms a light drivenwater splitting device which will allow increasing the solar to hydrogen efficiency above 10%. Targeted efficiency is 20%

MARKETING OPPORTUNITIES

The invention relates to the field of renewable energy and specifically to the generation of solar hydrogen—solar fuel—by water splitting for harvesting and storing solar energy in several fields of application such as car industry/automotive, semiconductor industry, chemical industry

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