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**Mesoporous titanium oxide microspheres for high-efficient cadmium sulfide quantum dot-sensitized solar cell and investigation of its photovoltaic behavior**

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Graphical abstract

Highlights

- Mesoporous TiO<sub>2</sub> microspheres with large surface area were employed to fabricate photoanodes of QDSCs.
- The photovoltaic properties were studied upon lock-in-based surface photovoltage measurements.
- The mesoporous TiO<sub>2</sub> microspheres possess effective light scattering ability.
- Improved conversion efficiency was obtained when compared with the QDSC based on TiO<sub>2</sub> (P25).

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