Magnetron sputtering solar cells

Can magnetron sputtering improve sputtered perovskite solar cells?
The efficiency and stability of sputtered perovskite solar cells can be enhanced significantlyby optimizing the sputtered processes and improving the crystallization,which lay a solid foundation for further study of the preparation of perovskite solar cells by magnetron sputtering.

What is magnetron sputtering?
Magnetron sputtering is one of the most well-developed vapor deposition techniques in the electronics industry,with advantages such as wide material selection,uniform and dense film formation,and a fast deposition speed. All functional layers of PSCs can be deposited with magnetron sputtering.

How stable is a magnetron sputtering device?
Thanks to the dense and stable inorganic CTL,the device exhibited excellent long-term stability,maintaining 93.5% of its initial PCE after being placed in a nitrogen box for 2000 h. This work,for the first time,achieved magnetron sputtering deposition of all functional layers for PSCs.

Can PSCs be deposited with magnetron sputtering?
All functional layersof PSCs can be deposited with magnetron sputtering. Replacing the organic charge transport layer (CTL) with a sputtered inorganic CTL can also reduce cost and improve stability. However,due to the working principle of momentum exchange in magnetron sputtering,the deposited particles have an extremely high kinetic energy.

Can magnetron sputtered electron blocking layer improve dye-sensitized solar cell performance?
Augustowski, D., Kwasnicki, P., Dziedzic, J. & Rysz, J. Magnetron sputtered electron blocking layer as an efficient method to improve dye-sensitized solar cell performance. Energies 13, 2690 (2020). Odari, V., Musembi, R. & Mwabora, J. Enhanced performance of Sb 2 S 3 mesoscopic sensitized solar cells employing TiO 2: Nb compact layer. J. Mater.

Does magnetron sputtering damage soft lattice perovskite material?
However,due to the working principle of momentum exchange in magnetron sputtering,the deposited particles have an extremely high kinetic energy. It will damagethe soft lattice perovskite material if the deposition process is continued upon the perovskite layer.

Recently, organic-inorganic halide perovskites solar cells (PSCs) emerged as a promising photovoltaic technology and a remarkable highest power conversion efficiency (PCE) of 22.1% has been demonstrated based on mesoscopic PSCs [7].Mesoscopic PSCs usually employ a mesoscopic layer sintered at high temperature as a scaffold, which increases the fabrication ...

In this paper, a series of blocking layer variants, based on TiO 2 and ZnO:TiO 2, were obtained using the

reactive magnetron sputtering method. Material composition, structure and layer...

In this study, we have demonstrated the significant advantages of magnetron-sputtered NiO x ...

Herein we report an investigation of a CH 3 NH 3 PbI 3 planar solar cell, showing significant power conversion efficiency (PCE) improvement from 4.88% to 6.13% by introducing a homogeneous and uniform NiO blocking interlayer fabricated with the reactive magnetron sputtering method.

In this research, using radio frequency magnetron sputtering (RFMS), TiO 2 cp layers were fabricated and the thickness could be controlled by deposition time; CH 3 NH 3 PbI 3 films were...

The semiconductor antimony sulfide (Sb 2 S 3) is a potential absorber materials for the top sub-cell of Si-based tandem solar cells because of its appropriate band-gap, simple binary composition, nontoxic elements, and long-term stability this study, polycrystalline Sb 2 S 3 films were fabricated by post-annealing of radio frequency (RF) magnetron sputtered ...

In this work, a simple and effective magnetron sputtering method was ...

Herein we report an investigation of a CH 3 NH 3 PbI 3 planar solar cell, showing significant power conversion efficiency (PCE) improvement from 4.88% to 6.13% by introducing a homogeneous and uniform NiO ...

Room-Temperature Sputtered SnO 2 as Robust Electron Transport Layer for Air-Stable and Efficient Perovskite Solar Cells on Rigid and Flexible Substrates

All functional layers of PSCs can be deposited with magnetron sputtering. Replacing the organic charge transport layer (CTL) with a sputtered inorganic CTL can also reduce cost and improve stability. However, due to the ...

Radio frequency (RF) magnetron sputtering was used to deposit tungsten disulfide (WS2) thin films on top of soda lime glass substrates. The deposition power of RF magnetron sputtering varied at 50 ...

Cu(In, Ga)Se2 (CIGS) solar cell is one of the most promising thin film solar cells. However the marketization of the CIGS solar cells is hindered by the uncertainty of the element ratios. Traditional sputtering with post selenization is one of the most widespread methods to produce the CIGS solar cells. Nevertheless, the post selenization process is the most difficult ...

The fabrication of Sb2Se3 thin-film solar cells deposited by a pulsed hybrid reactive magnetron sputtering (PHRMS) was proposed and examined for different growth conditions. The influence of growth temperature and Se pulse period were studied in terms of morphology, crystal structure, and composition. The Sb2Se3 growth showed to be dependent ...

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In this work, an efficient method of magnetron sputtering using Sb 2 S 3 target followed with post-sulfurization or post-selenization heat treatment process has been used to prepare S-Sb 2 S 3 and Se-Sb 2 S 3 thin films, then substrate structured Sb 2 S 3 solar cells with configuration of Mo/Sb 2 S 3 /CdS/ITO/Ag were fabricated.

In this research, using radio frequency magnetron sputtering (RFMS), TiO 2 ...

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