Oxygen and carbon content in solar cells

Does oxygen affect the conversion efficiency of solar cells?
Oxygen is known to affect the conversion efficiency of solar cells. Both for Cz- and multicrystalline silicon a degradation of the solar cell performance has been reported [12 to 19]while an improvement has been observed for polycrystalline ribbon material .

Can a silicon ring reduce oxygen content in high-efficiency solar cells?
High-efficiency solar cells require monocrystalline silicon wafers with lower oxygen content. This paper presents a design for an oxygen-lowering ring to decrease the oxygen content of 300 mm monocrystalline silicon,and experimentally verifies its effectiveness in reducing oxygen.

How mc-Si ingots affect solar cell performance?
The performance of solar cell depends directly to thequality of wafer and impurities distributionin mc-Si ingot. In our study we investigate the distribution of the interstitial oxygen (O i) and substitutional carbon (C s),from the bottom to top of the silicon ingot.

What causes precipitation of oxygen and carbon?
Precipitation of oxygen and carbon occurs during crystal growth and solar cell processing. Depend- ing on the thermal conditions and the initial oxygen and carbon content various types of SiO2,SiC precipitates and oxygen related defects are observed and investigated by IR spectroscopy and transmission electron microscopy.

Do oxide precipitates affect solar cell performance?
The behavior of oxide precipitates during solar cell fabrication processes and the resulting effect on device performance have been investigated by transmission electron microscopy (TEM) observation.

What is the concentration of global carbon and oxygen in bricks?
The concentration of global carbon and oxygen in the centre and corner bricks was investigated using the Secondary Ion Mass Spectroscopy (SIMS) technique. The concentration of oxygen and carbon in the center bricks were1.8 10 18 and 2 10 18 atoms/cm 3,and in the corner bricks 4.6 × 10 19 and 9 × 10 19 atoms/cm 3,respectively.

Large energy loss (Eloss) caused by defect-assisted recombination makes the photovoltaic performance of carbon-based perovskite solar cells (C-PSCs) inferior to that of metal-electrode ones. Herein, the influence of environmental factors (moisture and oxygen) on defect management during re-annealing process of CsPbI2Br crystalline films is systematically ...

These results thus reveal that oxygen precipitation can be controlled by varying the crystal growth conditions, possibly contributing to the production of high-efficiency solar ...

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There are varieties of solar cell materials with different content of interstitial oxygen. The characteristics of these materials with respect to interstitial oxygen and the measurement are also described in this section. One of the two main oxygen-related defect types, the thermal donors, is the subject of the second section. They are known to degrade the ...

Oxygen and carbon are the main impurities in multicrystalline silicon for photovoltaic applications. Precipitation of oxygen and carbon occurs during crystal growth and solar cell processing. ...

Abstract: The behavior of oxygen precipitates under solar cell fabrication processes and the effect on device performance were investigated using TEM observation. Samples were prepared with different carbon concentration and with two sets of growth conditions. The number of precipitates correlates monotonically with the carbon concentration ...

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We propose a novel hole-transporting bilayer as a selective contact for fully ambient printed perovskite solar cells with carbon electrodes. We selectively deposit two hole-transporting materials with an energetic offset between their HOMO levels and achieve not only improved power conversion efficiencies compared with conventional devices with single hole ...

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