

# New energy storage silicon wafer

Are silicon nanowires a promising material for energy conversion & storage?

Due to their unique structural, electrical, optical, and thermal properties, silicon nanowires (SiNWs) are attracting immense interest as a promising material for advanced energy conversion and storage applications.

Can thin silicon be used to prepare ultrathin silicon wafers?

In this contribution, we present a thin silicon with reinforced ring (TSRR) structure at the edge region, which can be used to prepare ultrathin silicon wafers with a large area and provide support throughout the solar cell preparation process to reduce the breakage rate.

Can surface-treated thin silicon wafers be electrolyte-free and void-free electrodes?

Here, we demonstrate that surface-treated thin silicon wafers could serve as monolithic additive-free, electrolyte-free, and void-free electrodes that can achieve high areal capacity at room temperature ( $\sim 25 \text{ }^\circ\text{C}$ ). A dense solid electrolyte interface could effectively suppress the cracks and pulverization found in the liquid electrolyte.

How is a n-type silicon wafer made?

The fabrication process starts from cleaving an n-type silicon wafer into  $2.5 \text{ cm} \times 2.5 \text{ cm}$  chips. These are then cleaned using RCA1 ( $\text{H}_2\text{O}_2$ - $\text{NH}_4\text{OH}$ - $\text{H}_2\text{O}$ ) and RCA2 ( $\text{H}_2\text{O}_2$ - $\text{HCl}$ - $\text{H}_2\text{O}$ ) solution, as well as a Piranha Etch ( $\text{H}_2\text{SO}_4$ - $\text{H}_2\text{O}_2$ ).

How big is a silicon wafer?

All silicon wafers are 4 inches (10 cm) in size and the width of reinforced ring is 3 mm. The first case is self-weight (handling or transferring). Figure 2a shows simplified schematic diagram of thin silicon wafer with a fixed position under the effect of gravity (corresponding to Fig. 1b and c).

How is a silicon wafer made?

Silicon wafer was cut into strips with a width of 1 mm and a length of 100 mm as electrodes, and argon gas was injected into the chamber as a protective atmosphere. The plasma discharge was used at 11 kV. During the process, plasma and arc vaporized silicon rods were generated.



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