

Amorphous silicon powder

Amorphous silicon can be fabricated by liquid quenching method!

Application to anode materials, etc.

Overview

Silicon (Si) has been attracting attention as an anode material for lithium-ion batteries and as an electrode material for next-generation batteries because its weight capacity density is more than 10 times that of graphite. However, there are problems such as the volume expansion of about four times during charging, which causes the electrode to break down and prevents excellent cycle performance, and this is an obstacle to its practical use as an anode material.

In all-solid-state batteries, thin-film amorphous silicon is used as an anode material, and although excellent cycle characteristics have been reported, it is fabricated by vacuum evaporation or vapor-phase growth methods, which poses a problem for mass production.

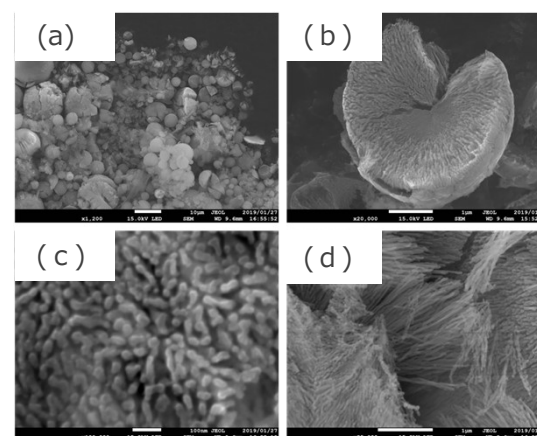
The present invention solves the above problem and relates to a method for mass production of amorphous silicon having a porous structure.

Product Application

- Anode materials for lithium ion batteries, all solid state batteries etc

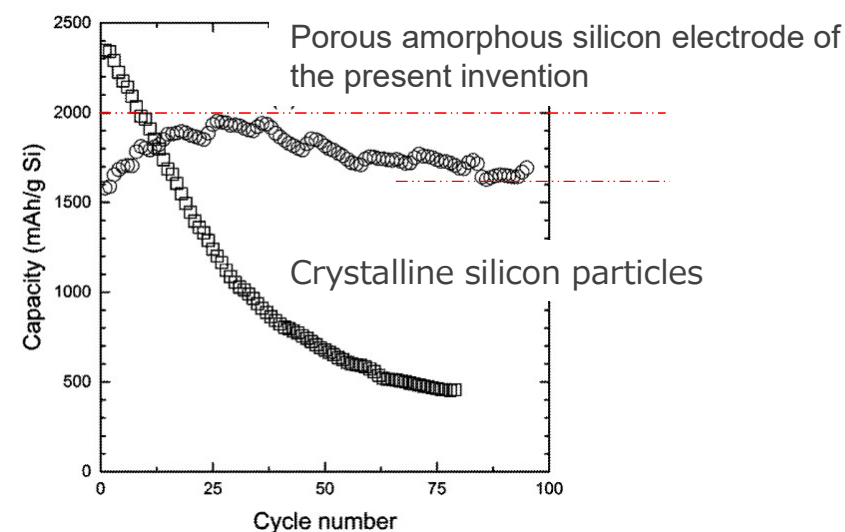
IP Data

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(b), (c) Porous lamellar structure with a mean lamellar diameter and a mean column diameter of about 20-30 nm and spacing between adjacent lamellae of less than a few 10 nm
(d) Columnar structure with a mean column diameter of about 100 nm, length of about 1 μm, aspect ratio of about 10, and spacing between adjacent column of less than 100 nm

Features · Outstandings



The maximum charge-discharge characteristic of the porous amorphous silicon electrode (0.5C) and crystalline silicon particles (0.25C) is about 2000mAh/g, and the capacity after 100 cycles is 1600-1700mAh/g, reducing the rate of decline to about 15-20%.

Contact