

November 8, 2017
Nippon Electric Glass Co., Ltd.

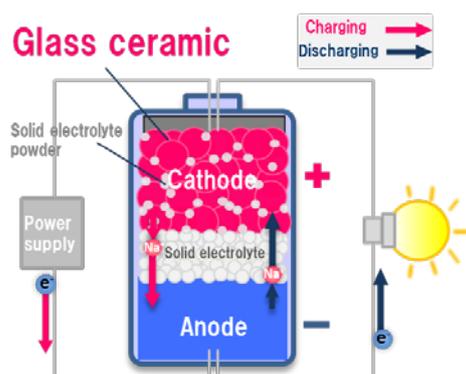
World's First Achievement:
Development of all solid state sodium (Na)-ion secondary battery using glass ceramic cathode, and successful operation at room temperature

Nippon Electric Glass Co., Ltd. (Head Office: Otsu, Shiga, Japan; President: Motoharu Matsumoto) has developed all solid state Na-ion secondary battery using glass ceramic cathode that can be operated at room temperature. This is the world's first achievement as for all solid state Na-ion secondary battery using glass ceramic cathode.

Lithium (Li)-ion secondary battery with organic electrolyte is known as a high performance rechargeable battery. However, it has safety concerns since cases of accidental ignition by abnormal heat generation have been reported. As a solution to such safety concerns, all solid state Li-ion secondary battery using non-flammable solid electrolyte is intensively studied. Due to its technical issues such as low chemical stability in the air and low ionic conductivity between electrode and electrolyte, all solid state Li-ion secondary battery is yet to be in practical use. In addition, Li is a rare metal and its instability of raw material supply is also concerned.

We, as a manufacturer of special glass, have developed various specialized glass products with excellent properties. With our accumulated technologies, we have fabricated all solid state Na-ion secondary battery using Na-based glass ceramic cathode and realized its operation at room temperature. Hereafter, we will focus on realizing next-generation secondary battery to solve conventional issues.

(Schematic illustration for structure of all solid state Na-ion secondary battery)



(Lighting test in the form of cell battery)



(Features)

1. Safety

- There is no risk of accidental ignition or toxic substance generation during use or manufacturing process since all the components can be made of inorganic oxides.

2. High battery performance

- High ionic conductivity and operation at room temperature are realized through the integration of electrode and solid electrolyte by utilizing the softening fluidity of glass.
- Longer life is realized since solid electrolyte leads to less deterioration by ionic conduction.
- Battery with higher energy density can be realized with its simple structure and the development of high voltage cathode active material.

3. Raw material availability

- Na has lower risk of instability of raw material supply compared with Li due to its abundant resource amount.