Amorphous silicon dioxide as an anode material for li-ion batteries

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In recent decades, progress in Li-ion batteries (LIBs) has grown dramatically. In 2016, about 6.4 billion cells were sold of LIBs and this is equivalent to 90 GWh [1]. even the Nobel Prize in Chemistry in 2019 was awarded to John Goodenough (USA), Stanley Whittingham (Great Britain) and Akira Yoshino (Japan) for the development of lithium-ion batteries. But work on improving the Li-ion batteries is still ongoing.
SiO_2 is one of the most widely used materials on earth. SiO_2 is one of the most widely used materials on earth and is uses in the fields of medicine, cosmetics, agroindustry, electronics [2,3], and has also begun research on the use of SiO_2 as an anode material in lithium-ion batteries [4]. It has a high theoretical capacity (1965 $mAh \bullet g^{-1}$) [5].

SiO_2 obtained by us is amorphous and the source is rice husk (RH) from Kazakhstan (Kyzylorda region). Material synthesis is divided into two stages. Stage 1 includes washing pre-treatment by HCl and calcination at 600°C (SiO_2-1). Stage 2 includes purification by dissolving in NaOH and extraction pure (SiO_2-2) by adding HCl and washing by distilled water. The use of 1 stage material as an anode material in lithium-ion batteries has shown good stability. Microstructure of SiO_2-1 and SiO2-2 differs from each other. SiO_2-2 at the beginning showed good stability, but from the 10th cycle, it began to lose capacity.

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