Surface studies of Na$_3$Ti$_2$O$_7$ electrodes for rechargeable sodium-ion batteries

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Nowadays, the Li-ion battery research is focused in the development of high energy and high voltage batteries to cover the needs of the portable electronics market and electric vehicle industry. However, in order to fulfill the continuously increasing energy demand, more efficient distribution grids and bulk energy storage systems have to be developed. For this, Na-ion batteries are becoming an attractive solution for stationary energy storage, where, despite the increase of weight from lithium to sodium, the total price is decreased by using aluminium current collectors. The behaviour and composition of the electrolyte at room temperature. Spots indicate where the XPS measurements have been performed.

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References


Despite the formation of a passivating layer, the measured cyclability of the electrode and its specific capacity can position the Na$_3$Ti$_2$O$_7$ as a cheap and competitive anode for Na-ion batteries which can certainly be further improved after optimization of different parameters of synthesis and laminate preparation.

Fig. 1: Galvanostatic cycling of Na$_3$Ti$_2$O$_7$ vs. Na between 2.5-0 V at C/10 from the first to the third oxidation/reduction cycles using 1M NaClO$_4$ in EC:PC as electrolyte at room temperature. Spots indicate where the XPS measurements have been performed.