Electrochemical mechanism of M_xSb ($0 \leq x \leq 0.5$, M=Sn, Bi, Fe) phases in Na batteries.

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In the new exciting research on efficient electrode for Na-ion batteries, p-element-based electrodes have shown to be viable alternatives to hard carbon, providing very interesting performances with reversible capacities largely exceeding 400 mAh/g.[1-3] We have investigated several antimonides M_xSb ($0 \leq x \leq 0.5$, M=Sn, Bi, Fe) (Figure 1) as electrode materials for Na batteries. The thorough investigation of both mechanism (through in situ XRD, NMR, and Mössbauer spectrometry) and performances will be presented.

The role of the second element (Sn, Bi and Fe) on the good performance of these electrodes will be discussed. An XPS analysis will be presented to discuss about the solid electrolyte interphase (SEI) formed during the reversible sodiation in the Sb/Na batteries cycled in various electrolytes. [4, 5]

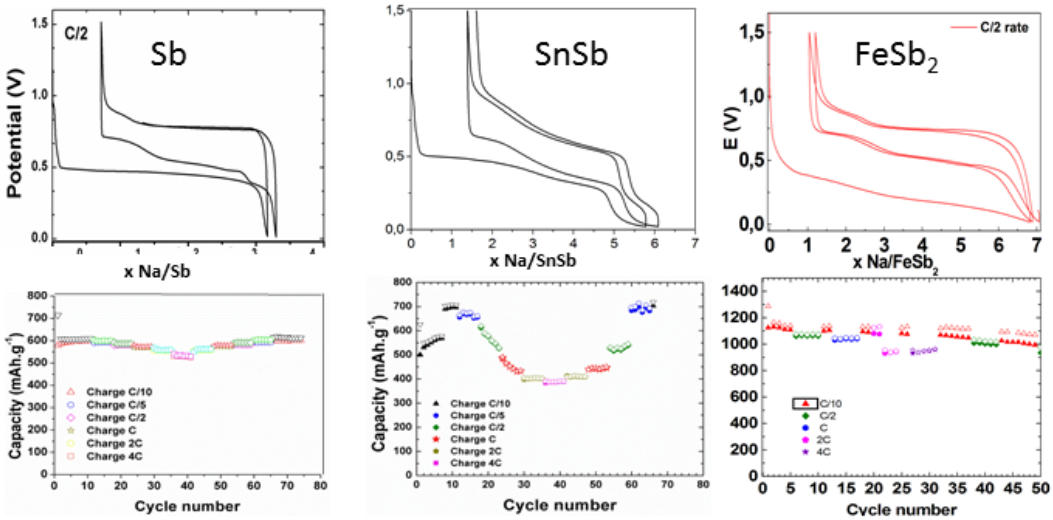

Fig. 1: above: Galvanostatic curves of M_xSb ($0 \leq x \leq 0.5$, M=Sn, Fe) /Na, bottom: associated rate capability.

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