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Polyanionic Materials at the Positive of Na-ion Batteries

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Submission and Application / In what language you will speak?
Presentation in English

Submission and Application / Declaration of consent:
YES / Consent granted (Contact details and short abstract may be published in all conference documents, including virtual ones)
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TOPIC 09 - Ceramics for energy, chemistry and environment
Submission / Application:
Invited speaker (Lecture)

Polyanionic materials are intensively studied as promising positive electrode materials for Na-ion batteries thanks to their high stability and fast ionic mobility within their structural framework.[1-3] Among those polyanionic materials, $Na_3V_2(PO_4)_2F_3$ and $Na_3(VO)_2(PO_4)_2F$ are the two most attractive ones due to their high voltage for two Na+ ions extraction and their high theoretical energy densities: 500 $mAh.g^{-1}$ and 495 $mAh.g^{-1}$, respectively. These two compositions are indeed the two end members of a family of compounds described with the general formula $Na_3V_2(PO_4)_2F_{3-y}O_y$ where $0 \leq y \leq 2$.

We will first discuss the stability of these active compounds in aqueous media and in enlarged potential window,[4] and the performance of optimized carbon-coated stoichiometric $Na_3V_2(PO_4)_2F_3$ in a large panel of cycling conditions (at different rates, temperatures etc.).[5-6] Then, we will show how cationic and anionic substitution have been widely explored with the target to reversibly de-intercalate and re-intercalate the third Na^+ ion from/in the structure.

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