Colloidal synthesis of $LiFe_{(1-x)}Mn_xPO_4$ nanoplatelets with tunable electrochemical properties

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$LiFe_{(1-x)}Mn_xPO_4$ was explored by Yamada[1] and Zhao-Hui Wang[2]. Here we present an easy colloidal synthesis of $LiFe_{(1-x)}Mn_xPO_4$ ($0 \leq x \geq 1$) nanoplatelets with tunable electrochemical properties in the potential range of 3 – 4 Volts simply changing the molar ratio between Fe (II) and Mn (II) ions in the olivine structure. So in one single step it's possibile to generate cathode materials with tunable redox potential synthesizing nanoplatelets with a different intermediate phases between tryphilite $LiFePO_4$ and lithiophilite $LiMnPO_4$ (*Fig1*).

This result was recently patented:

http://www.iit.it/it/trasferimento-tecnologico/brevetti/smart-materials-patents/item/shape-control-synthesis-of-lithium-iron-phosphate-nanocrystals-via-colloidal-synthesis.html?category_id=8

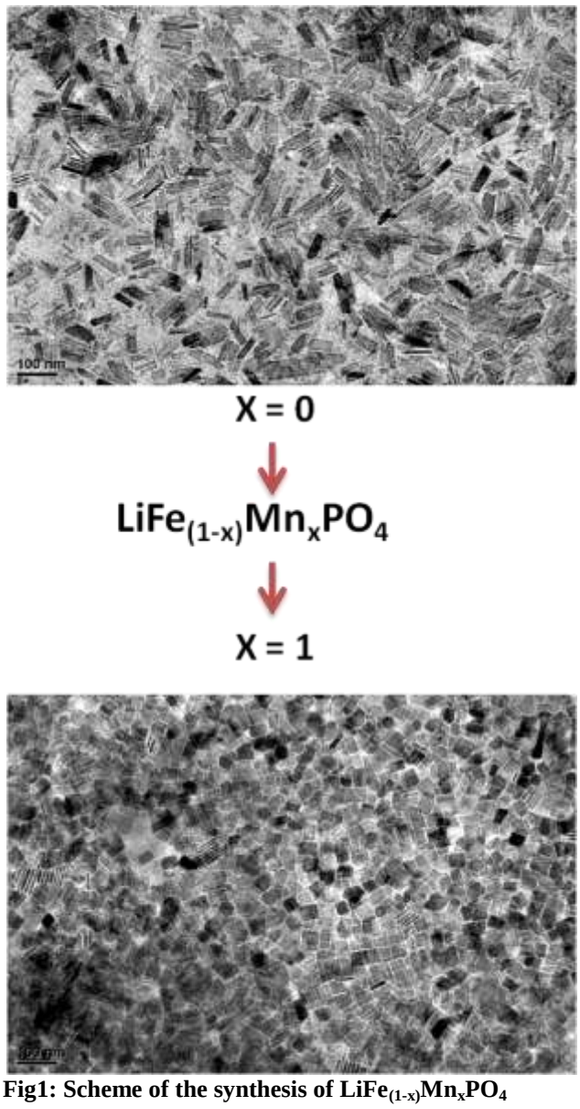

Fig1: Scheme of the synthesis of $LiFe_{(1-x)}Mn_xPO_4$

References

1 Yamada et al. *Journal of The Electrochemical Society*, **148** (10) A1153-A1158 (2001)
2 Zhao – Hui Wang et al. *Journal of Alloys and Compounds* **532** (2012) 25– 30