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CURRENT SYMPOSIUM: SYMPOSIUM 6: Advanced Materials and Technologies for Direct Thermal Energy Conversion and Rechargeable Energy Storage

CURRENT SESSION: Advanced anode and cathode materials for lithium batteries

PRESENTATION TYPE: Contributed (Oral)

TITLE: Amorphous lithium manganate, a new matrix for high density Li ion batteries

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ABSTRACT BODY: Due to their low weight, high energy densities and long cycle life, the development of rechargeable Li-ions batteries is a major scientific challenge. For many applications requiring energy storage, the need to increase the energy density of storage devices is of first importance, this is the reason why the battery scientific community is studying intensively and worldwide new high capacity cathodes materials.

After a composition screening, a new material family has been discovered in the Li-Mn-O system and has been investigated as potential new material for Li-ion batteries to replace conventional NMC materials ($\text{LiNi}_{1/3}\text{Mn}_{1/3}\text{Co}_{1/3}\text{O}_2$). In this study we report for the first time the synthesis, structural and electrochemical characterizations of a new non-lamellar oxide with the highest capacity observed ever before in the Li-Mn-O system. This new patented material is prepared at the nano-scale (5-10 nm) by mechanical alloying at room temperature, which shows a discharge capacity of 300 mAh/g. It is a rock-salt type nanostructured material, prepared by a direct mechanochemical synthesis.

In this work are reported the first structural and electrochemical characterizations of a new active compound as positive electrode for Li-ion batteries.

KEYWORDS: Manganese oxide, rock salt, lithium ion.