THE EFFECT OF COATING ON $LiN_{0.33}Mn_{0.33}C_{0.33}O_2$ WITH VANADIUM OXIDE AND ITS INTERACTION WITH AQUEOUS PROCESSING WITH APPLICATION IN SOLID-STATE BATTERY

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The compound $LiN_{0.33}Mn_{0.33}C_{0.33}O_2$ has high power, high energy, and a long lifetime but, despite these characteristics, it presents poor capacity due to its lower electrochemical performance limiting its application for electric vehicles. Unfortunately, in this material, Li presents a high chemical affinity with environmental moisture and CO_2 leading to a formation of LiOH and Li_2CO_3 provoking Li loss and hence performance degradation. These reactions limit the possibility of aqueous processing of these materials. The $LiN_{0.33}Mn_{0.33}C_{0.33}O_2$ was synthesized by the sol-gel wet method and then coated with V_2O_5 with various thicknesses to analyze its transfer charge, ionic diffusion, and stability. The powders were sintered through a conventional method. Electrochemical impedance spectroscopy (EIS) is used to measure ionic and electronic conductivity. Scanning electron microscopy (SEM), X-ray diffraction (XRD), and X-ray photoelectron spectroscopy (XPS) are used to confirm the phase and morphology of the compound. The results confirm that the layer V_2O_5 on the surface can stabilize the structure with H_2O interactions.

Keywords: Energy, Aqueous processing, Solid state

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