OFFICIAL ABSTRACT and CERTIFICATION

Controlling The Pathways To The Synthesis of a New Lithium Manganate

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Lithium manganate crystals are potential material for lithium-ion batteries. This project attempts to optimize the growth conditions for lithium manganate crystals in order to produce the most successful crystals. The results show that LiMnO2 -- a key precursor to growing lithium manganate single crystals -- must be of the highest possible purity for high yield crystal growth. Several variables that affect the purity of LiMnO2 were tested and it was found that the temperature at which the precursor is removed from a furnace as well as its growth environment strongly affect its quality. The ability to produce higher purity lithium manganate crystals could make lithium-ion batteries an even more efficient energy source, therefore reducing the human impact of climate change. This work was supported as part of GENESIS: A Next Generation Synthesis Center, an Energy Frontier Research Center funded by the U.S. Department of Energy, Office of Science, Basic Energy Sciences under Award Number DE-SC0019212.

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