**An investigation into the temperature phase transitions of synthesized materials with Al and Mg doped lithium manganese oxide spinels by in-situ powder x-ray diffraction**

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**SUPPLIMENTARY INFORMATION:**

TABLE SI: Topas Rietveld results of Li1.03Mn1.97O4

|  |  |  |
| --- | --- | --- |
| **Temperature (°C)** | **Rwp** | **GoF** |
| 400 | 5.19 | 1.21 |
| 500 | 5.20 | 1.23 |
| 600 | 5.11 | 1.18 |
| 700 | 5.16 | 1.16 |
| 800 | 5.22 | 1.19 |
| Room temperature (29°C) | 5.92 | 1.42 |

TABLE SII: Topas Rietveld results of Li1.03Mg0.2Mn1.77O4

|  |  |  |
| --- | --- | --- |
| **Temperature (°C)** | **Rwp** | **GoF** |
| 400 | 2.86 | 1.11 |
| 500 | 2.74 | 1.07 |
| 600 | 3.21 | 1.05 |
| 700 | 3.26 | 1.09 |
| 800 | 2.76 | 1.09 |
| Room temperature (29°C) | 2.68 | 1.05 |

TABLE SIII: Topas Rietveld results of LiAl0.4Mn1.6O4

|  |  |  |
| --- | --- | --- |
| **Temperature (°C)** | **Rwp** | **GoF** |
| 400 | 5.65 | 1.27 |
| 500 | 5.81 | 1.28 |
| 600 | 5.76 | 1.26 |
| 750 | 6.30 | 1.35 |
| 800 | 6.12 | 1.31 |
| Room temperature (29°C) | 5.71 | 1.34 |

Figures S1 to S6 are a representation of the Topas Rietveld refinement plots for one of the oxide materials investigated (Li1.03Mn1.97O4).



Figure S1: Topas Rietveld refinement graph of Li1.03Mn1.97O4 at 400 °C



Figure S2: Topas Rietveld refinement graph of Li1.03Mn1.97O4 at 500 °C



Figure S3: Topas Rietveld refinement graph of Li1.03Mn1.97O4 at 600 °C



Figure S4: Topas Rietveld refinement graph of Li1.03Mn1.97O4 at 700 °C



Figure S5: Topas Rietveld refinement graph of Li1.03Mn1.97O4 at 800 °C



Figure S6: Topas Rietveld refinement graph of Li1.03Mn1.97O4 at 29 °

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