

# Antisolvent Precipitation for Metal Recovery from Citric Acid Solution in Recycling of NMC Cathode Materials

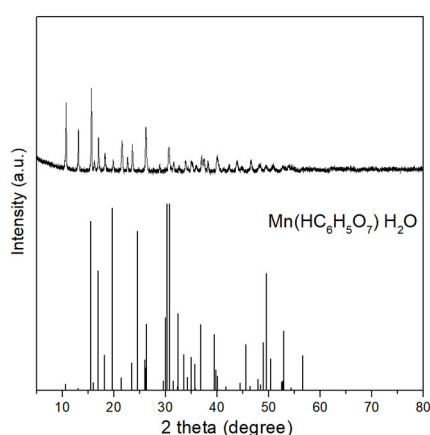
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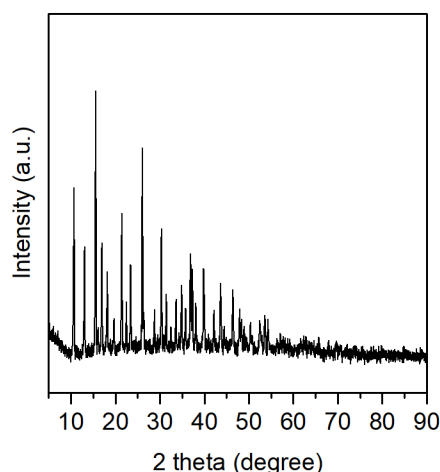
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**Figure S1.** XRD pattern of the leach residue and the reference pattern of manganese citrate monohydrate,  $\text{Mn}(\text{HC}_6\text{H}_5\text{O}_7)\text{H}_2\text{O}$  [1].



**Figure S2.** XRD pattern of the precipitate from the manganese citric acid ethanol system (M7).

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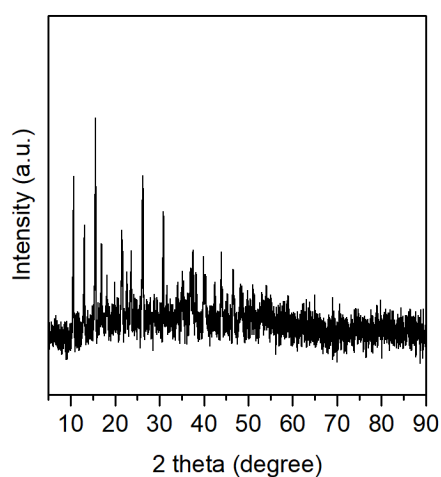
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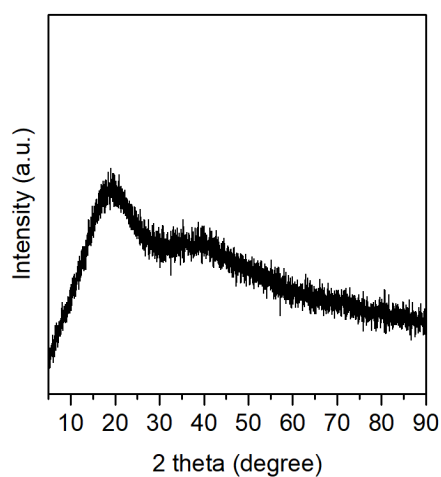
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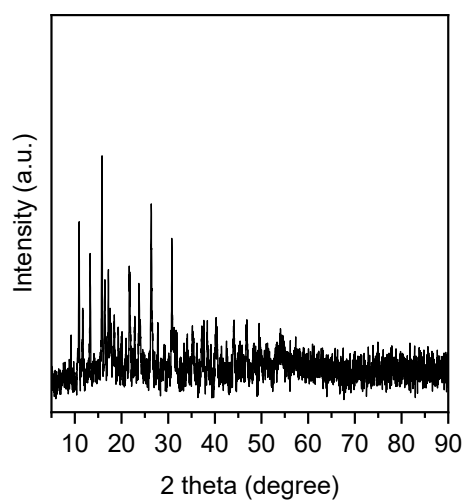
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**Figure S3.** XRD pattern of the precipitate from the cobalt citric acid ethanol system (C7).



**Figure S4.** XRD pattern of the precipitate from the nickel citric acid acetone system (N8).



**Figure S5.** XRD pattern of the mixed solid phase from the NMC leach liquor acetone system (LNMC4).

## Reference

1. Deng, Y.-F.; Zhou, Z.-H.; Wan, H.-L.; Ng, S.W.  $\Delta$ -Aqua-S-citrato(2-)-manganese(II). *Acta crystallographica. Section E, Structure reports online* **2003**, *59*, m310–m312. <https://doi.org/10.1107/S1600536803009383>.