

Supporting Information

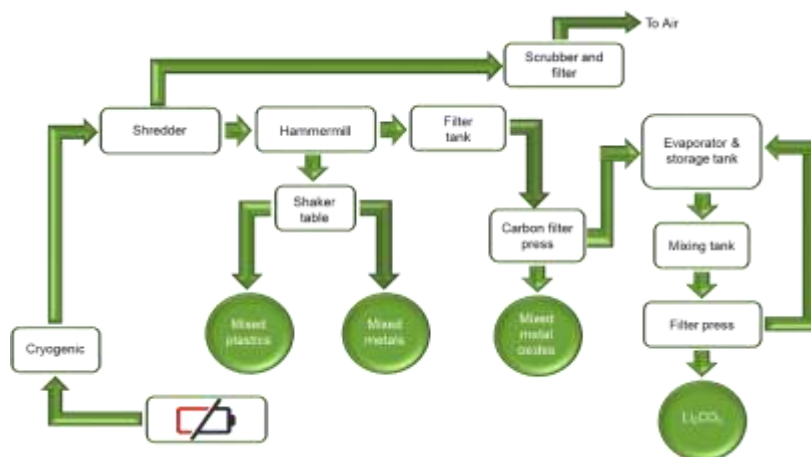
**Hydrometallurgical recycling technologies for NMC Li-ion battery cathodes: Current industrial practice and new R&D developments & trends**

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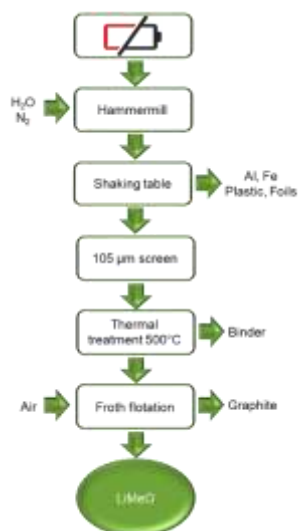
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**SUPPLEMENTARY FIGURES**

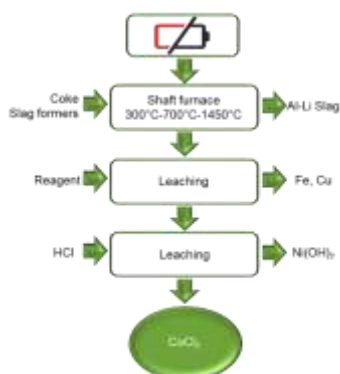


Supplementary Figure S1 Toxco recycling process (adapted from [1])



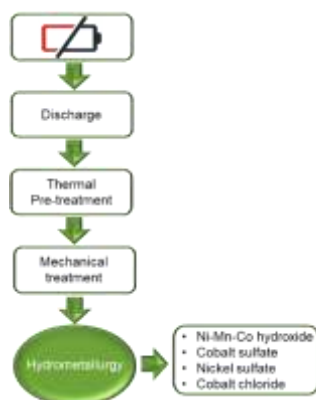
Supplementary Figure S2 Retriev LIB recycling process for cathode-grade material regeneration (adapted from [2])

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Supplementary Figure S3 Unicore LIB recycling process (adapted from [2])

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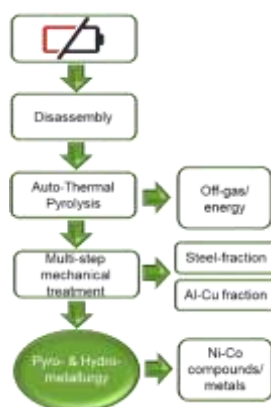


Supplementary Figure S4 Brunp LIB recycling process (adapted from [4])

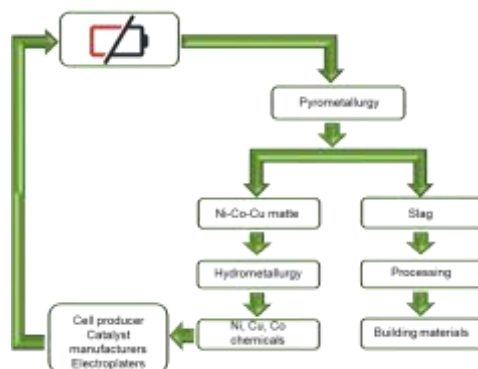
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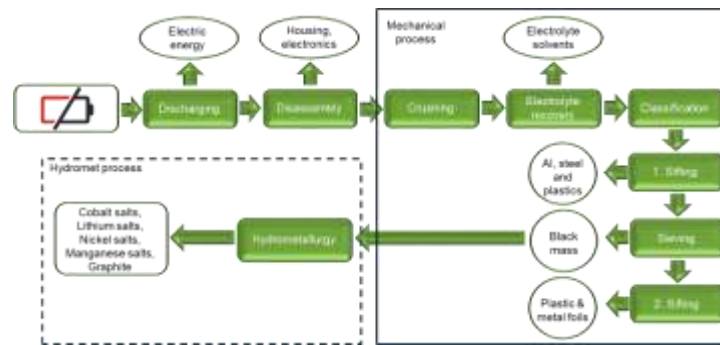
Supplementary Figure S5 GEM Ltd. recycling process [3].



Supplementary Figure S6 Accurec Recycling GmbH LIB recycling process [3].



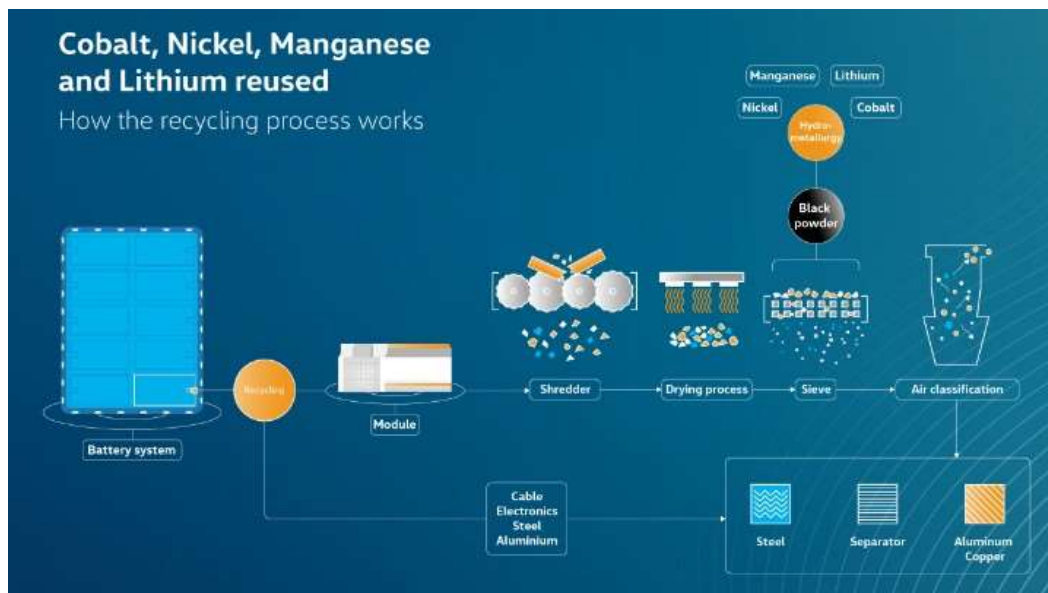
Supplementary Figure S7 Nickelhütte LIB recycling process [2].



Supplementary Figure S8 Duesenfeld LIB recycling process [4].



Supplementary Figure S9 SungEel HiTech LIB recycling process [3].



Supplementary Figure S10 Volkswagen adopted the LithoRec process for recycling LIBs [5].

## REFERENCES

- [1] L. Gaines, J. Sullivan, A. Burnham and I. Belharouak, "Life-cycle analysis for lithium-ion battery production and recycling," in Transportation Research Board 90th Annual Meeting, Washington, 2010.
- [2] O. Velazquez-Martinez, J. Valio, A. Santasalo-Aarnio, M. Reuter and R. Serna-Guerrero, "A critical review of lithium-ion battery recycling processes from a circular economy perspective," Batteries, vol. 5, no. 4, p. 68, 2019.
- [3] R. Sojka, P. Qiaoyan and L. Billmann, "Comparative study of Li-ion battery recycling processes," ACCUREC Recycling GmbH, 2020.
- [4] J. Diekmann, "Ecologically friendly recycling of lithium-ion batteries-the lithorec process," ECS Trans., vol. 73, no. 1, pp. 1-9, 2016.
- [5] Volkswagen, "Volkswagen Aktiengesellschaft," 2019. [Online]. Available: <https://www.volkswagenag.com/en/news/stories/2019/02/lithium-to-lithium-manganese-to-manganese.html>. [Accessed 2 April 2022].