



Ning Yao

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Master's Degree**Research direction: Energy storage device (Lithium-ion batteries)**

Summary

A student proficient in English, majoring in Materials and Chemical Engineering. The undergraduate school is **XUT** (Xi'an University of Technology) and the graduate school is **NPU** (Northwestern Polytechnical University), both specializing in the field of lithium-ion batteries. Having more than three years of extensive research experience and contributed to the publication of academic papers. The undergraduate and graduate scores are in the top 5% and 2%, respectively, of the college. Possess a strong aptitude for learning and hard work. The main research direction is the **recycling of spent lithium-ion batteries and the pre-lithiation**.

Education

- **Northwestern Polytechnical University (985)** Master's in Materials and Chemical Engineering
GPA: 87/100 (3.70) top 2% 2021-2024
Key Modulus: Fundamentals, Measurement Methods and Applications of Electrochemistry, Nanostructured Materials and Nanotechnology, Modern Method of Material Research, Electron Microanalysis, Transitional Metal Oxides, Introduction to Carbon Materials
- **Xi'an University of Technology** Bachelor's in Applied Chemistry
GPA: 93/100 (4.30) top 5% 2017-2021
Key Modulus: Materials Chemistry, Electrochemistry, Inorganic Chemistry, Organic Chemistry, Physical Chemistry, Analytical Chemistry, Fundamentals of Engineering Graphics, Polymer Chemistry and Physics, Structural characterization, Biochemical Engineering Applications
- **Skills**
Structure and morphology characterization: In-situ XRD, TEM, AFM, In-situ optical microscopy
Electrochemical measurements: GCD test, CV, EIS, Amperometric I-t curve, Tafel test
Computer skills: Origin, 3Dmax, ChemDrew, NanoScope Analysis
IELTS: 7 (All the minor points are above 6) CET4: 529 CET6: 437

Work Experience

- **Geely—Zeekr Intelligent Technology Co., Ltd (World Top 500)**
Cell Engineer July 2024-August 2025
In compliance with customer requirements and market dynamics, design and optimize the cell system to guarantee consistent performance during fast charging or other extreme conditions.

Scientific Achievements

- **SCI papers:**
(**First author**): Upcycling the Spent Graphite Anode into the Prelithiation Catalyst: A Separator Strategy toward Anode-free Cell Prototyping (**Advanced Materials, IF=26.8**) DOI: [10.1002/adma.202408268](https://doi.org/10.1002/adma.202408268)
(**First author**): Resuscitation of Spent Graphite Anodes towards Layer-stacked, Mechanical-flexible, Fast-charging Electrodes (**Energy Storage Materials, IF=20.2**) DOI: [10.1016/j.ensm.2022.12.001](https://doi.org/10.1016/j.ensm.2022.12.001)
(**Second author**): Upcycling of High-rate Ni-rich Cathodes through Intrinsic Structural Features (**Advanced Energy Materials, IF=26.0**) DOI: [10.1002/aenm.202402918](https://doi.org/10.1002/aenm.202402918)

(Third author): Multiscale Interfacial Regulation of Zn-V₂O₅ Pouch Cell via Ultrathin Molecular-Engineered Separator (**Advanced Functional Materials, IF=19.0**) DOI: [10.1002/adfm.202400959](https://doi.org/10.1002/adfm.202400959)

- **Patents:**

(Authorized) A Preparation Method of a PP-based Lithium Supplementary Separator and Anode-Free Lithium-Ion Battery **Publication Number: CN116565448A**

(Authorized) Preparation Method and Application of C₃N₄-catalyzed High-Performance Lithium Replenishment Separator **Publication Number: CN117810571A**

Scientific Research Experience

Resuscitation of Spent Gr Anodes towards Layer-stacked, Mechanical-flexible, Fast-charging Electrodes (Two SCI Papers)

- A facile and energy-saving “green route” was proposed to extract values from the spent graphite anode. Through elucidating the dynamic Li occupancy in graphite lattice, an up-scaling delamination protocol is developed to generate few-layer graphene flakes (GF, ~2 nm). Upon exquisite interfacial tuning, the as-exfoliated GF tends to assemble with the Na₂Ti₆O₁₃ (NTO) nanosheets as a proof-of-concept anode.
- Project results: The as-constructed layer-stacked configuration demonstrated robust cycling at various flexing states and extreme power output of 1142 W kg⁻¹ as paired with the LiFePO₄ cathode in the integrated, thin-film battery model (pGF0.16-N/NTO||LFP).

Upcycling the Spent Gr Anode into the Prelithiation Catalyst: A Separator Strategy toward Anode-free Cell Prototyping (SCI Paper & Patent)

- An "integrated closed-loop route" was proposed to upcycle the SGr anodes into the prelithiation catalyst with the tuning of interlayer spacing and defect concentration. Upon the incorporation of the calcinated Li₅FeO₄ (LFO) within the defect-rich FGF scaffold, the ultra-thin separator enabled a customized prelithiation amount for the retired LFP recovery, without any tedious electrode processing or strict environmental control for cell manufacturing.
- Project results: This separator strategy modulated the interfacial chemistry of the FGF-Cu substrate in the anode-free cell model, and the impressive cycling endurance, energy density of 386.6 Wh kg⁻¹, as well as the extreme power output of 1159.8 W kg⁻¹ were achieved on the 1.5 Ah pouch-format cell level.

Trapping C₃N₄ with SGr to Investigate the Catalytic Mechanism of Li-supplementary (Patent)

- For efficient electrochemical Li-supplementary, the decomposition voltage of the commercial Li₂C₂O₄ was significantly lowered by the co-catalytic effect of graphene flakes captured with g-C₃N₄ to accelerate the de-intercalation rate of active Li⁺. Meanwhile, N atoms in g-C₃N₄ can promote the desolvation of Li⁺, constructing a modulating layer on the collector for uniform Li plating/stripping behaviour.
- Project results: This work aimed at the sluggish kinetics of Li⁺ release in the prelithiation reagent, and the designed module of the anode-free battery achieves high energy density and cycling endurance.

Additional Achievements

- Won the title of "**Outstanding graduates**" at Northwestern Polytechnical University April 2024
- Won the title of "**National Scholarship**" in the School of Materials Science and Engineering for excellent grades during the 2022-2023 academic year October 2023
- Won the prize of "**Provincial First Prize of the 14th Challenge Cup Extracurricular Academic and Technological Works Competition for Undergraduates**" May 2023
- Won the prize of "**Provincial Gold Prize of the 8th China International Internet Plus Innovation and Entrepreneurship Competition for College Students**" August 2022
- Won the honorary title of "**Young Pioneer Team in the fight against COVID-19**" April 2022
- 2018-2019 School-level "**Excellent News Propaganda Individual Work Award**" June 2019