

UNIVERSITA' DEGLI STUDI DI GENOVA

AREA RICERCA, TRASFERIMENTO TECNOLOGICO E TERZA MISSIONE

SERVIZIO RICERCA

SETTORE RICERCA NAZIONALE

IL RETTORE

- Visto il Decreto Rettorale n. 4421 del 19/09/2024, con il quale è stato indetto il concorso, per titoli e colloquio, per il conferimento di n. 1 borsa di ricerca post- laurea di tipo consolidator della durata di 6 mesi, dell'importo di € 9.684,00 (novemilaseicentottantaquattro/00), eventualmente rinnovabile, per lo svolgimento di una ricerca sul tema: "Sviluppo di catodi per batterie a ioni di litio allo stato solido e loro caratterizzazione elettrochimica", presso il DCCI dell'Università degli Studi di Genova;
- Visto il Decreto Rettorale n. 5299 del 31/10/2024 con il quale è stata costituita la Commissione giudicatrice per il conferimento della suddetta borsa di ricerca;
- Visto il verbale della Commissione giudicatrice del concorso in parola, riunitasi in data 05/11/2024;
- Constatata la regolarità della procedura seguita;

DECRETA

Art. 1

Sono approvati gli atti del concorso di cui in premessa e la seguente graduatoria di merito:

Dott.re Hanxin Mei	punti 95/100
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Sotto condizione dell'accertamento dei requisiti di cui al bando, è dichiarato vincitore del concorso in parola il Dott.re Hanxin Mei.

IL RETTORE
(firmato digitalmente)

Hanxin Mei

Email: _____

Education

2021.11-2024.12	University of Genoa	Chemical Sciences and Technologies	Ph.D
2018.09-2021.06	Zhengzhou University of Light Industry	Chemical Engineering	M.S
2019.09-2021.06	University of Camerino	Chemistry and Advanced Chemical Methodologies	M.S
2014.09-2018.06	Shenyang University of Chemical Technology	Engineering	B.S

Research project:

✓ Research on the mechanical properties of halide-polymer composite solid electrolytes (2023.08 -11)

Conduct research on the mechanical properties of solid electrolytes jointly with the IEK-2 Institute under the Jülich Research Center, and measure Young's modulus, axial strength, Poisson's ratio and other properties through bending tests, fracture tests, B3B tests and other characterizations.

✓ Research on halide-polymer composite flexible solid electrolytes (2022.09 - present)

Developed all-solid-state batteries using halide-polymer composite solid-state electrolytes for Phase Motion Control company, responsible for the synthesis of composite electrolytes, modification of positive and negative electrode materials, and electrode sheet manufacturing. Then analyze the electrochemical performance of the corresponding solid-state battery, and be responsible for the study of the mechanism and the characterization at the micro scale.

✓ Application of halide solid-state electrolytes based on Li_3InCl_6 in lithium metal batteries (2021.11-present)

Developed lithium metal all-solid-state batteries based on Li_3InCl_6 for Phase Motion Control company, responsible for the synthesis of early solid-state electrolytes and modification of the cathode materials used, modification of lithium metal anode, electrode sheet manufacturing and other work. Then analyze the electrochemical performance of the corresponding solid-state battery, and be responsible for the study of the mechanism and the characterization at the micro scale.

✓ Research on the large-scale synthesis of various halide solid electrolytes by liquid phase method (2021.11-2022.12)

Halide solid-state electrolytes such as Li_3InCl_6 and Li_3YCl_6 were successfully synthesized on a large scale through the liquid phase method combined with vacuum drying, which avoided the high energy and time consumption of previous mechanochemical synthesis, significantly improved the synthesis efficiency, and lowered the synthesis threshold.

✓ Joint project between the European Union and the Italian Ministry of Energy: Research on silicon-doped biocarbon anode materials derived from bamboo leaves (2021.11-present)

Through high-temperature carbonization, acid and alkali washing and other methods combined with rapid preparation of graphite-based bio-anode with controllable silicon content, it still has a stable discharge capacity of more than 500 mAh/g after running for more than 300 cycles.

✓ **Application of nickel-cobalt phosphate-based materials in supercapacitors and lithium-ion batteries (2018.09-2019.09)**

✓ **Research on new NiMoO₄/CoMoO₄ materials for enhanced performance (2018.09-2019.09)**

Publications:

- ✓ **Mei, H. X.**, Piccardo, P., Carraro, G., Smerieri, M., & Spotorno, R. (2023). Thin-film Li₃InCl₆ electrolyte prepared by solution casting method for all-solid-state batteries. *Journal of Energy Storage*, 72, 108244. <https://doi.org/10.1016/j.est.2023.108244>
- ✓ **Mei, H. X.**, Piccardo, P., Cingolani, A., & Spotorno, R. (2023). Unconventional solid-state electrolytes for lithium-based batteries: Recent advances and challenges. *Journal of Power Sources*, 553, 232257. <https://doi.org/10.1016/j.jpowsour.2022.232257>
- ✓ Zhang, Y., **Mei, H. X.**, Cao, Y., Yan, X. H., Yan, J., Gao, H. L., ... & Gui, Y. H. (2021). Recent advances and challenges of electrode materials for flexible supercapacitors. *Coordination Chemistry Reviews*, 438, 213910. <https://doi.org/10.1016/j.ccr.2021.213910>
- ✓ Zhang, Y., **Mei, H. X.**, Yang, J., Wang, S. W., Gao, H. L., Jia, X. D., ... & Gao, K. Z. (2020). New NiMoO₄/CoMoO₄ composite electrodes for enhanced performance supercapacitors. *Ionics*, 26, 3579-3590. <https://doi.org/10.1007/s11581-020-03470-3>
- ✓ Zhang, Y., **Mei, H. X.**, Gao, H. L., Huo, Q. Y., Jia, X. D., Cao, Y., ... & Gao, K. Z. (2020). Metal oxide modified (NH₄)(Ni,Co)PO₄·0.67H₂O composite as high-performance electrode materials for supercapacitors. *Inorganic Chemistry Communications*, 112, 107696. <https://doi.org/10.1016/j.inoche.2019.107696>
- ✓ Zhang, Y., **Mei, H. X.**, Yang, J., Gao, H. L., & Jia, X. D. (2021). Facile Synthesis of Novel Parallelogram-Like NH₄CoPO₄·H₂O/Ni₃(PO₄)₂·8H₂O/MnO₂ Composites for High-Performance Supercapacitors. *Journal of Electrochemical Energy Conversion and Storage*, 18(1). <https://doi.org/10.1115/1.4046279>
- ✓ Zhang, Y., **Mei, H. X.**, Yang, J., Wang, S. W., Gao, H. L., Jia, X. D., ... & Gao, K. Z. (2020). Platanus fruit-like nickel cobalt ammonium phosphate/MWCNTs composite grown on nickel foam for high-performance supercapacitors. *Nano*, 15(04), 2050044. <https://doi.org/10.1142/S1793292020500447>
- ✓ Zhang, Y., Yang, J., **Mei, H. X.**, Gao, H. L., ... & Gao, K. Z. (2021). Al(NO₃)₃ Induced Morphological Changes in Nickel and Cobalt Salts as Advanced Electrodes for Supercapacitors. *Journal of Electrochemical Energy Conversion and Storage*, 18(4), 041001. <https://doi.org/10.1115/1.4049812>
- ✓ Zhang, Y., Chang, C., Jia, X., Cao, Y., Yan, J., Luo, H., Gao, H., Ru, Y. **Mei, H. X.**, Zhang, A., Gao, K., & Wang, L. (2019). Influence of Metallic Oxide on the Morphology and Enhanced Supercapacitive Performance of NiMoO₄ Electrode Material. *Inorganic Chemistry Communications*. 112. 107697. <https://doi.org/10.1016/j.inoche.2019.107697>
- ✓ Zhang, Y., Chang, C., Jia, X., Huo, Q., Gao, H., Yan, J., Zhang, A., Ru, Y., **Mei, H. X.**, Gao, K., & Wang, L. (2019). Morphology-Dependent NiMoO₄/Carbon Composites for High Performance Supercapacitors. *Inorganic Chemistry Communications*. 111. 107631. <https://doi.org/10.1016/j.inoche.2019.107631>

Note: When I was the second author, the first author was my supervisor at the time.

Conferences and other experiences:

2024/06/09-06/12	Stresa, Italy	37th Topical Meeting of the International Society of Electrochemistry
2023/11/09-11/10	Wenzhou, China	2023 International Energy Materials Conference (Best Poster)
2023/08/01-11/01	Jülich, Germany	Research on the determination of mechanical properties of solid electrolytes at the Jülich Research Center
2023/05/23-05/25	Stuttgart, Germany	The battery show “Electric & Hybrid VehicleTechnology”
2022/09/11-09/16	Szeged, Hungary	ELI-ALPS collaborative project on energy materials characterization (laser, neutron, X-ray, etc.)
2022/07/24-07/27	Bertinoro, Italy	Summer training and seminar on energy and alloys organized by the Italian Metallurgical Association

Awards:

Best Poster, National scholarship for master (Top 3%), first-class academic scholarship for master(*2), second-class academic scholarship for master, first-class international exchange scholarship (*2).

Skills:

Language skills	Chinese (Mother tongue)
	English (IELTS 6.5)
	Italian (A2)
Software skills	Proficient in using MS Office series office software, and professional software such as Jade, Origin, EC-Lab etc.
Research skills	5 years of experience in the design, synthesis, testing and analysis of lithium-ion battery materials, mainly including the design, synthesis, analysis of halide and polymer solid electrolytes, as well as the screening, modification and preparation of electrode materials.
	Proficient in various conventional characterization methods and electrochemical analysis and testing methods, including but not limited to CV, GCPL, EIS, XRD, BET, XPS, SEM, etc.
Other skills	With more than four years of living experience in Europe, I can well cope with the differences between different countries and can better adapt to business trips and other official duties.
