大连理工大学
DALIAN UNIVERSITY OF TECHNOLOGY

DECEMBER 2020 – JANUARY 2021

ISSUE 20

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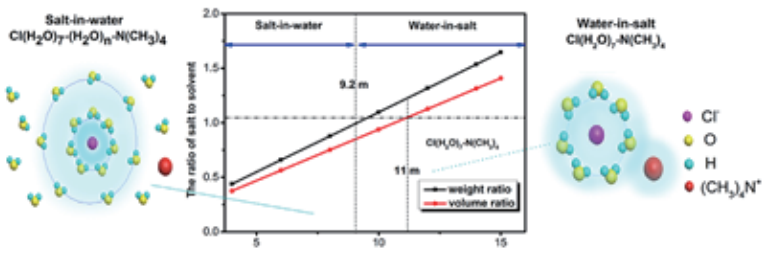
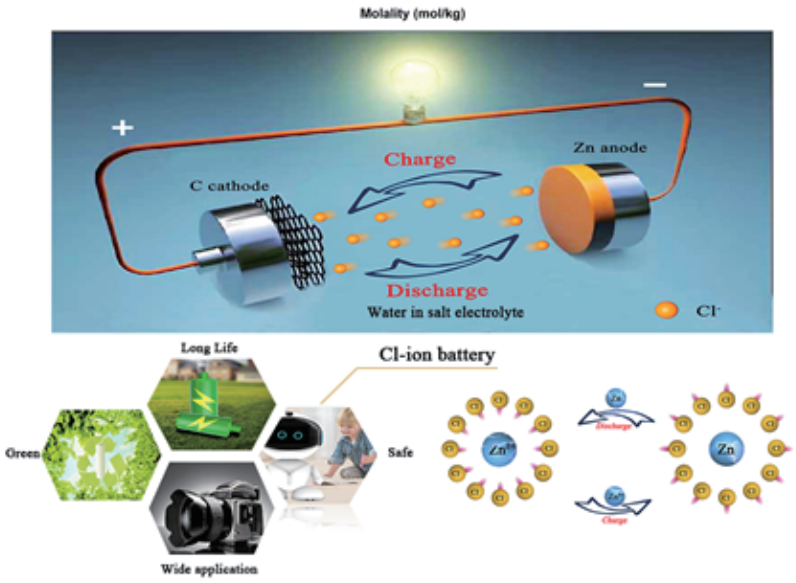
DUT Published Breakthrough Work in *iScience*

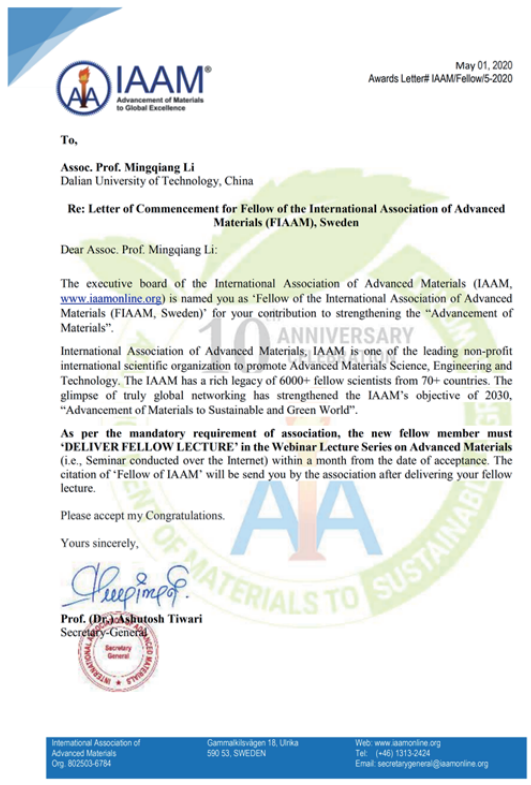
From School of Energy and Power Engineering

The research team of Assoc. Prof. Li Mingqiang from School of Energy and Power Engineering, DUT, has made a breakthrough in green power battery by proposing a high performance Chloride-ion battery based on "water-in-salt" electrolyte. The research work entitled *High-Voltage and Long-Lasting Aqueous Chlorine-Ion Battery by virtue of "water-in-salt" electrolyte* was published in ***iScience.*** Graduate student Li Tong is the first author, and Assoc. Prof. Li Mingqiang is the corresponding author.





Chloride-ion battery (CIB) is regarded as a promising electrochemical storage device due to their high theoretical volumetric capacities, low cost, and high abundance. However, low-cycle life limits its application in the energy storage field. Herein, the research team reports a rechargeable CIB composed of a "water-in-salt" electrolyte, a zinc anode, and a carbon cathode (graphene, carbon nanotubes, carbon black). These cathodes exhibit initial reversible specific capacities of 136, 108, and 102 mAh g−1, respectively. Especially, a reversible discharge capacity of 95 mAh g−1 was retained after 2000 cycles when graphene is used as the cathode. Such high cycling stability was first reported in CIBs. Furthermore, the use of "water-in-salt" electrolytes has improved the discharge platform of aqueous CIBs to 2.6V. The charge and discharge mechanism of the carbon cathode was investigated by TEM, FTIR, Raman, and XPS, proving the chloride ions reversible absorption/desorption in carbon cathodes.



IAAM
Advancement of Materials to Global Excellence

May 01, 2020
Awards Letter# IAAM/Fellow/5-2020

To,

Assoc. Prof. Mingqiang Li
Dalian University of Technology, China

Re: Letter of Commencement for Fellow of the International Association of Advanced Materials (FIAAM), Sweden

Dear Assoc. Prof. Mingqiang Li:

The executive board of the International Association of Advanced Materials (IAAM, www.iaamonline.org) is named you as 'Fellow of the International Association of Advanced Materials (FIAAM, Sweden)' for your contribution to strengthening the "Advancement of Materials".

10 ANNIVERSARY

International Association of Advanced Materials, IAAM is one of the leading non-profit international scientific organization to promote Advanced Materials Science, Engineering and Technology. The IAAM has a rich legacy of 6000+ fellow scientists from 70+ countries. The glimpse of truly global networking has strengthened the IAAM's objective of 2030, "Advancement of Materials to Sustainable and Green World".

As per the mandatory requirement of association, the new fellow member must 'DELIVER FELLOW LECTURE' in the Webinar Lecture Series on Advanced Materials (i.e., Seminar conducted over the Internet) within a month from the date of acceptance. The citation of 'Fellow of IAAM' will be send you by the association after delivering your fellow lecture.

Please accept my Congratulations.

Yours sincerely,

Prof. (Dr.) Ashutosh Tiwari
Secretary-General

International Association of Advanced Materials
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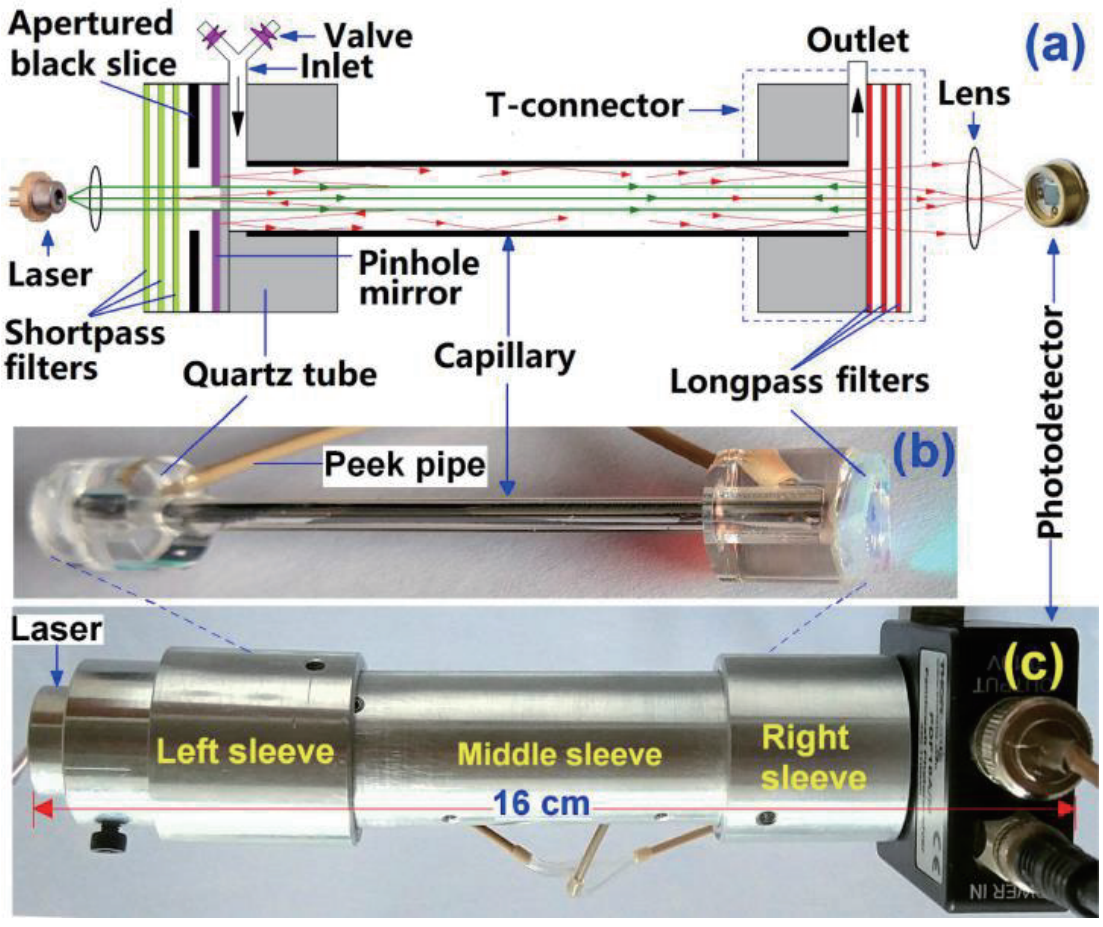
In recent years, Li Mingqiang's team has been dedicated to the research and development of high-performance green batteries, and has made a series of progress. After they developed a high-energy nickel-zinc battery (which was selected as one of the top 10 global battery breakthroughs in 2018 by Lithium Big Data, http://www.juda.cn/news/37693.html), they also proposed the first high-energy iodine-ion battery and bromine-ion battery, and the related results were published in ***Journal of Power Sources*** (https://doi.org/10.1016/j.jpowsour.2019.227511) and ***Sustainable Energy & Fuels*** (https://doi.org/10.1039/D0SE00161A) respectively. In recognition of his outstanding contributions in the field of advanced materials, Assoc. Prof. Li Mingqiang was awarded the title of "IAAM Fellow" by International Association of Advanced Materials (IAAM) in 2020, which is the world's leading academic organization in the field of advanced materials.

Link to the paper: https://www.cell.com/iscience/fulltext/S2589-0042(20)31173-1

Prof. Huang Hui's Team Invented A New Type Of Laser-induced Fluorescence Instrument

From Faculty of Electronic Information and Electrical Engineering

Recently, Prof. Huang Hui's team has invented a new type of laser-induced fluorescence (LIF), namely "Pinhole Metal Capillary LIF (PMC-LIF)", in which "pinhole" can avoid the contact and scattering of the laser beam with the sidewall of capillary, and "metal capillary" can avoid laser leakage, thus the background signal and related noise can be suppressed utmostly. This work entitled *A compact, low-cost and high sensitive LIF based on pinhole metal-capillary and direct laser-diode excitation* was published in ***Optics and Lasers in Engineering*** (JCR Q1, IF4.27).



For LIF, the SNR and related concentration detectability was severely limited by background signal (noise). Herein, an axial-excitation LIF based on pinhole metal-capillary (PMC) and direct laser-diode excitation was proposed. An overall ~480 fold improvement on SNR was realized, because the laser-sidewall interaction (LSI) and related background signal (noise) can be effectively suppressed in PMC by avoidance of laser leakage and laser contact with capillary sidewall. For rhodamine B detection without sample enrichment, a detection limit of concentration (DLC) of 0.4 pM was obtained, which is 2.5 fold lower than the DLC (1 pM) of commercial LIFs equipped with bulky and expensive Ar^+ laser. For selective detection of Cu^{2+}, a DLC of 5 pM was realized, which is more than 40 fold lower than that of previous fluorimetry detection with similar quantum-dot probe. The PMC-LIF features compact ($16 \times 4 \times 4$ cm^3), low-cost and high concentration detectability.

Prof. Huang Hui from Faculty of Electronic Information and Electrical Engineering, Dalian University of Technology, has long been devoted to the research of photodetection and micro/nano sensors, and has published more than forty academic papers in famous journals (*e.g., nano. lett.*) as the first author or corresponding author.

Link to the paper: https://www.sciencedirect.com/science/article/pii/S0143816620319266

“After Giving Rose to Others, Fragrance Remains with the Hands” -DLI Excellent Students’ Notes Collection

From Leicester International Institute

The collection of excellent study notes from Leicester International Institute (DLI) students has been carried out in an orderly manner, and the first batch of study notes have been bound and collected recently for the students of relevant majors to study. The notes were shared by 17 students from three grades majoring in Mechanical Engineering and Chemistry, with a total of 26 volumes.

Recently, Prof. Zhan Jingjing, the Dean of DLI, presented students who shared their study notes with specially customized notebooks as rewards. Prof. Zhan shared his experience of studying in the U.S. and his thoughts on the value of taking and sharing study notes. He spoke highly of the students’ notes and encouraged them to take notes persistently and be introspective while practicing and being steadfast and ambitious.

Under the initiative of Prof. Zhan, the activity aims to cultivate students’ spirit and temperament of independent thinking, truth-seeking, innovation and win-win. With the active promotion and encouragement of student advisors of all grades in DLI, students enthusiastically participate in this activity. Even though DLIers could not return to campus due to the impact of the COVID-19 epidemic in spring semester 2020, 17 students shared the study notes of their major courses in different ways.

Moreover, they could share any versions they want, such as the original version, the photocopied version or the digital version. The original notes will be stored in their original form and will be mailed to the students when they need to retrieve them someday. The photocopied notes are based on the version provided by the student, and they will be stored with DLI logo on the covers. As for the digital version, the notes will be collected in the computers at the Resource Room.

The students who share their notes will fill in their names, grades, majors, course names, and feelings on cards in memory of this activity. They will also get notebooks customized by DLI as rewards. Study notes are a collection of all the ideas and understandings we have about what we have learned. They are the most colorful and warm records of the university life, and DLI uses each notebook to keep and share the beautiful four years of students.