## PhD studentship (Full-time)

| | |
|---|---|
| Institution | Xi'an Jiaotong-Liverpool University, China |
| School | School of Science |
| Supervisors | Principal supervisor: Assistant Professor Dr Qiuchen Dong (XJTLU)<br>Co-supervisor: Associate Professor Dr Lifeng Ding XJTLU)<br>Co-supervisor: Lecturer Dr Joe Forth (UoL) |
| Application Deadline | Open until the position is filled |
| Funding Availability | Funded PhD project (world-wide students) |
| Project Title | Metal oxides-based functional materials tuning by Schottky barrier height in gas sensors in microfluidic channel for lithium-ion-battery (LIB) thermal runaway |
| Contact | Please email qiuchen.dong@xjtlu.edu.cn (XJTLU principal supervisor's email address) with a subject line of the PhD project title above.<br><br>The principal supervisor's profile is linked here: https://scholar.xjtlu.edu.cn/en/persons/QiuchenDong |

**Requirements:**

The candidate should have a first class or upper second class honours degree, or a master's degree (or equivalent qualification), in chemistry, applied chemistry, materials science, chemical engineering, biomedical engineering.

Evidence of good spoken and written English is essential. The candidate should have an IELTS score of 7 or above, if the first language is not English. This position is open to all qualified candidates irrespective of nationality.

**Degree:**

The student will be awarded a PhD degree from the University of Liverpool (UK) upon successful completion of the program.

**Funding:**

The PhD studentship is available for three years subject to satisfactory progress by the student. The award covers tuition fees for three years (currently equivalent to RMB 99,000 per annum). It also provides up to RMB 16,500 to allow participation at international conferences during the period of the award. The scholarship holder is expected to carry out the major part of his or her research at XJTLU in Suzhou, China. However, he or she is eligible for a research study visit to the University of Liverpool up to six months, if this is required by the project.

**Project Description:**

Current thermal runaway monitoring in lithium-ion batteries (LIBs) primarily relies on physical parameter such as internal temperature and short circuit. However, these methods offer limited capacity to inform the battery management system (BMS) effectively, potentially compromising driver and passenger safety. A lithium-containing transition metal oxide is proposed in this work as a core sensing material for ethylene carbonate (EC) and propylene carbonate (PC), two commonly used electrolytes. $LiMn_2O_4$ is proposed to integrate in a microfluidic channel and modify with lanthanide oxide-based humidity adsorbents, such as $CeO_2$ and $Nd_2O_3$. To enhance the electron transfer, doping with noble metals, e.g. gold, will be used to optimize Schottky barrier, which forms between metal and transition metal oxides that enables a tailored sensing material. This research aims to develop a novel method for designing ultra-sensitive and reproducible sensing materials in LIBs electrolyte leakage.

For more information about doctoral scholarship and PhD programme at Xi'an Jiaotong-Liverpool University (XJTLU), please visit

https://www.xjtlu.edu.cn/en/admissions/global/entry-requirements/

https://www.xjtlu.edu.cn/en/admissions/global/fees-and-scholarship

**How to Apply:**

Interested applicants are advised to email qiuchen.dong@xjtlu.edu.cn (XJTLU principal supervisor's email address) the following documents for initial review and assessment (please put the project title in the subject line).

- CV
- Two formal reference letters
- Personal statement outlining your interest in the position
- Certificates of English language qualifications (IELTS or equivalent)
- Full academic transcripts in both Chinese and English (for international students, only the English version is required)
- Verified certificates of education qualifications in both Chinese and English (for international students, only the English version is required)
- PDF copy of Master Degree dissertation (or an equivalent writing sample) and examiners reports available