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▼ [Personal Information](#)

Email Address	zhanglf@mail.sustech.edu.cn
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Gender	Female
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Date of Birth	08-Dec-1993
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Identity Document Type	STUDENT VISA
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Contact Number	
Disability	---
Disability Details	---

▼ [Programme Choice](#)

Scheme Research Postgraduate

Choice	Programme(s) applied	Code	Entry Year
1	Doctor of Philosophy (Full-time)	31601-FD	September 2022

Department

DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING

Research Area 1	Proposed Chief Supervisor 1
Environmental Engineering	Prof. Li Xiang Dong

▼ [Post-Secondary Qualification](#)

Date of Attendance Sep 2017 - Jul 2020

Mode of Study Full-time

Field of study Engineering

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Country/Region of Study China

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Online Verification Code	AAD8SUBWL2JRAP0Q
Degree Cert Online Verification Code	AF0GXY0NJFMHX1JW
Date of Award	Jul 2020
Award Classification	Not Applicable/Others

Date of Attendance	Sep 2012 - Jun 2016
Mode of Study	Full-time
Field of study	Science
University Ranking	
Country/Region of Study	China
Name of Institution	Northwest Normal University
Medium of Instruction	Chinese
Level of Award	Bachelor's degree
Means of Qualification	Coursework
Name of Programme/Award	Bachelor of Environment Science
Status	Graduated with award
Online Verification Code	APA4SRV4AAU79NH7
Degree Cert Online Verification Code	A7MSQRCXJ1H8RFYT
Date of Award	Jun 2016
Award Classification	Not Applicable/Others

▼ English Language Test

Test	International English Language Testing System (IELTS)
Test Date	May 2022
Test Result updated by	31-May-2022

▼ Employment

Period	Dec 2021 - Present
Mode of Employment	Full-time
Field of Employment	Engineering
Name of Organisation	Southern University of Science and Technology
Job Position	Reaserch Assistant
Major Responsibilities	I am in charge of literature review and conducting research on reaction mechanism of indoor air pollutants.



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revision of national standard methods and rubber properties analysis.

Period

Jul 2016 - Jul 2017

Mode of Employment

Full-time

Field of Employment

Engineering

Name of Organisation

Drilling and Production Engineering Research Institute of Yumen Oilfield Company

Job Position

Trainee Engineer

Major Responsibilities

I was in charge of water and air environment quality monitoring in Yumen Oilfield.

▼ Training/Internship

Period

Jul 2014 - Sep 2014

Country/Region

China

Name of Organisation

Cold and Arid Regions Environmental and Engineering Research Institute, Chinese Academy of Sciences

Name of Programme

Sample pretreatment of plants

▼ Publication

Publication Type

Journal Paper

Author(s)

Lifang Zhang, Ruifen Jiang, Wanbin Li, Derek C.G. Muir, Eddy Y. Zeng

Name of Publication

Development of a solid-phase microextraction method for fast analysis of cyclic volatile methylsiloxanes in water

Name of Journal/Conference/ Publisher

Chemosphere

Publication Status

Published

Date of Publication

20-Feb-2020

Peer-Reviewed

Yes

Citation Information

DOI: 10.1016/j.chemosphere.2020.126304ISSN: 0045-6535PMID: 32120150Indexed: 2020-05-19

URL of Publication

<https://www.sciencedirect.com/science/article/pii/S0045653520304975>

Publication Type

Journal Paper

Autho

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Citation Information

DOI: 10.1016/j.scitotenv.2018.11.226ISSN: 0048-

9697PMID: 0469063Indexed: 2019-01-22

URL of Publication

<https://www.sciencedirect.com/science/article/pii/S0048969718345820>

▼ Past Research Experience, Proposed Research Topic/Plan and Vision Statement

Q1. Please provide your past experience or participation in research projects (max. 7,500 characters including spaces).

1 Development of a novel sample preparation technique for cVMS sampling. (Project Leader) 2017 - 2020

I was the main implementer of this project (includes water and air sample collection and analysis), responsible for experimental operation, collecting samples, analyzing data, writing paper, achievement sharing.

In my project, a new detection method based on solid phase microextraction was developed by using metal organic framework MIL-101 and polysulfone to prepare coated fiber instead of polydimethylsiloxane as adhesive to avoid the contamination. Due to their high volatility and high hydrophobicity, atmospheric environment is the main medium of cVMS. I also studied the distribution of cVMS in gas phase and particle phase in several different indoor air. Up to now, I have published the research paper in the journal of Chemosphere as first-author. During this time, I attended three academic conferences and gave an oral presentation on The 10th National Conference on Environmental Chemistry. Through these, I gained English paper reading, English scientific paper writing and presentation experience.

2 Study on the influence mechanism of dissolved organic matter in environmental water on the toxicity of micro plastic green algae. (Participant) 2019.10 - 2020.06

Works is about toxicity of water-borne bovine serum protein to micro plastic green algae.

3 Electrochemical detection of diethylstilbestrol based on functionalized boron nitrogen doped graphene. (Participant) 2014.09 - 2015.06

It is the innovative experimental research project of College of Geography and Environment Science, Northwest normal university. I participated in application, research of the project and writing.

Q2. Please provide your proposed research topic (max. 500 characters including spaces).

Reaction Mechanism of Nitrous Acid and Organic Amines in Indoor Environments

The purpose of this research is to explore the reaction mechanism and products between HONO and amine in indoor environments, verify the assumptions put forward in previous studies, and explore the effects of different environmental conditions and human activities on this reaction.

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Lightsey. Indoor has important sources of HONO and amine emissions. Formation of nitrosamines from the reaction of HONO and amine in indoor environments is potentially important and leading to harmful chemical exposure, yet the reaction mechanism needs experimental studies and field validation. HONO is an important trace gas in the atmosphere and contributes to the production of hydroxyl radical ($\cdot\text{OH}$). The major sources of HONO include: the primary emission of fuel combustion, the heterogeneous reaction of NO_2 on the surface and the homogeneous reaction of NO with $\cdot\text{OH}$ radical. In indoor atmosphere, major sources of HONO are direct emissions from gas stoves in kitchens and secondary formation from NO_x reaction on surfaces. Brauer et al. reported that cooking led to peak HONO levels 20–100 times greater than background levels; HONO mixing ratios of up to 50 ppbv were measured in kitchen. Compared with the outdoor atmosphere, e.g., 0.03-3 ppb reported by Spataro et al., the indoor HONO mixing ratio is about 20-90 ppb. It is showing that the indoor HONO mixing ratio is significantly higher than outdoors. Meanwhile, the indoor environment is a constantly evolving space where chemical exposure occurs as people spend about 90% of their time indoors. Therefore, compared with the outdoor HONO, the chemical migration and transformation of indoor HONO and the products produced by the reaction with other compounds deserve our attention. At the same time, nicotine, as the main amine from cigarette smoke, has been proved to react with HONO to produce N-nitrosamines. There are many other common organic amines in the indoor environment, such as methylamine, dimethylamine, aniline, diphenylamine, etc., which are widely used in dyes, drugs, textiles, leather products, polyurethane, rubber and other chemical products. Human activities indoors will also discharge organic amines, such as cleaning, cooking, barbecue, smoking, etc., which can be also involved in the reactions between HONO and amine. Most organic amines are semi-volatile, which can be easily combined with water and absorbed by particles in the atmosphere. They can also be sorbed to indoor surfaces such as glass, clothes and furniture with the settlement of particles and gases indoors. Organic amines distribute between the gas phase and the condensed phase including the surfaces or aerosol particles. Impermeable indoor surfaces may be covered with organic or aqueous films, which can be distributed by compounds according to their volatility or Henry's law constant. Reactions also occur within and on these surfaces to release new compounds and change surface characteristics. Therefore, it is necessary to verify that these indoor common amines will heterogeneously react with indoor HONO on the surface to produce harmful nitrosamines. In addition to research on reaction of HONO with lab-produced pure amine samples, we will also study the formation of nitrosamines in real indoor environments, as well as the formation and changes of products under different human activity conditions. These studies will form the basis for a more complete examination of the different environmental parameters that will better elucidate the formation mechanism of nitrosamines.

Research questions:

This study intends to explore:(1) The reaction process between indoor HONO and organic amines, including its reaction kinetics, mechanism and products. (2) Effects of different humidity, presence of other acids and base, photolysis, surface medium and thickness on the reaction of HONO with organic amines.(3) The species and concentration range of nitrosamines in genuine indoor environments. (4) Effects of indoor human activities such as smoking, cooking, and cleaning on the reaction between HONO and organic amines and their products.

Research methods:

The stable and continuous HONO source is produced by bubbling clean air through the mixed solution of NaNO_2 and H_2SO_4 . The HONO mixing ratio is measured by a chemiluminescence NO_x monitor (Model 42i; Thermo). By comparing with the off-line measurement using ion chromatography, the efficiency of molybdenum catalyst in converting HONO to NO was determined. The heterogeneous reaction between HONO and organic amines are affected by many environmental factors. Due to the low vapor pressure and affinity to water of most organic amines, the reaction kinetics and formation of reaction products likely depend on relative humidity. We plan to test the influence of humidity on the reaction mechanism firstly. Secondly, organic amines are alkaline compounds, similar to ammonia, and have acid neutralization ability. The reaction between HONO and organic amines may be affected by the presence of other acidic or basic species in indoor air or on surfaces. Moreover, organic amines tend to adhere to indoor surfaces such as glass, clothes and furniture with the settlement of particles or air. Due to the highly heterogeneous surface in the indoor environment, it has a variety of surface functional groups and surface areas. Some of these surfaces are relatively smooth, while some are rougher and have large voids, which is conducive to the sorption.

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My research experience:

I have a very good foundation for the use of gas chromatography-mass spectrometry. I am familiar with scientific software including GraphPad Prism, SigmaPlot and origin for digital art formation, SPSS for data analysis and management and other software. These skills are very useful and important for future.

Significance of the work:

At present, there are few studies on indoor HONO behavior, especially its reaction with other indoor pollutants, such as organic amines. Due to high indoor levels of HONO, the potential carcinogenicity of its products (nitrosamines) and the long time people stay in indoors, it is very important to explore the reaction mechanism between HONO and organic amines.

Q4. Reasons for wishing to pursue PhD studies in Hong Kong (max. 2,000 characters including spaces).



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The Faculty of Hong Kong universities is very strong. Most of the teachers of Hong Kong universities have experience of studying abroad. Many Hong Kong universities also teach with Nobel laureates. At the same time, they also maintain good academic exchanges with some domestic schools and share excellent teachers.

3. Superior geographical location

Compared with the United States, Britain and other countries, Hong Kong is closer to the mainland, its lifestyle is closer to the mainland, and it is more convenient to go home to visit relatives. If people want to go back to the mainland for development in the future, there are more opportunities.

4. Less cost and more scholarships

Some students in the Hong Kong International Student Forum said that compared with the expenses of studying in Europe and the United States, Hong Kong's educational resources are relatively cheap. At the same time, there are many scholarship programs in Hong Kong, which reduces the cost of studying to some extent.

Q5. Long-term career plan, aims and interests for future development after graduation (max. 2,000 characters including spaces).

After my PhD, I want to become a researcher in colleges or scientific research institutes and contribute to the field of Environmental Science in my future, and continue to work on indoor air pollution and human health. Because I am very interested in indoor air pollution and atmosphere chemistry. In particular, I realized there are many pollutants in the indoor environment and modern people spend more time indoors. The indoor air becomes a very important medium for human exposure, but research on indoor air pollution has not received so much attention as the outdoor atmosphere. Thus, I want to conduct in-depth research on indoor air and atmosphere chemistry, ultimately to reduce pollution exposure indoors. During this process, there are full of challenges, but I like to explore the unknown things and it can also arouse fighting spirit. In addition, I am a quiet, patient and meticulous person. I am suitable for scientific research and won't feel bored. Doing some research work can make me feel that I am contributing and valuable to the society. At the same time, it can also understand the latest scientific research achievements and progress and master the latest scientific information.

Q6. Contribution that you would like to make to the development of research in Hong Kong and to the society (max. 2,000 characters including spaces).



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graduation, engage in scientific research and teaching. I will continue to focus on scientific research and strive to cultivate more creative talents in teaching and educating people.

3. As a researcher who studies indoor ambient air, I also need to popularize more environmental protection knowledge and indoor pollution exposure risks to the public, so that the public can choose a more beneficial lifestyle.

Q7. Other information in relation to the application for Hong Kong PhD Fellowship (max. 2,000 characters including spaces).

None

Academic Referee

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Relationship with Referee	Dean
Position	Professor
Name of Institution/Organisation	Jinan University
Phone No	(86) 13631493839

Uploaded Document(s)

Description	File Name	File Size	Upload Date (HKT)



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2012 Bachelor's degree	<u>BachelorDegreeCertif...</u>	0.10 MB	02-Apr-2022 22:45:14
2012 Bachelor's degree	<u>BachelorGraduationC...</u>	0.05 MB	02-Apr-2022 22:45:14
2012 Bachelor's degree	<u>BachelorTranscript.pdf</u>	3.58 MB	02-Apr-2022 22:45:14
May 2022 International English Language Testing System (IELTS)	<u><Not yet uploaded></u>	--	
Others	<u>PERSONALSTATEMEN...</u>	0.51 MB	04-Apr-2022 10:33:59
Research Proposal	<u>RESEARCHPROPOSAL...</u>	2.38 MB	04-Apr-2022 10:04:41
	Total File Size	11.69 MB	

Declaration and Submit

- I declare that the information given in support of this application is accurate and complete, and understand that any misrepresentation will lead to disqualification of my application for admission to and registration with The Hong Kong Polytechnic University (PolyU).
- I confirm that I read and understood the "[Personal Information Collection Statement \(PICS\)](#)" of PolyU and "[Notice for Application from the European Area](#)".
-

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