

Lectures on Modern Chemistry 2022

Organised by: Department of Chemistry, The Chinese University of Hong Kong

Programme

Talk 1: 28 October 2022, Friday (Cantonese)

4:00 – 5:00 pm

Prof. Fuk Yee Michael Kwong

Innovative Catalysis: 4 Nobel Prizes in Chemistry within 20 Years

創新催化：二十年間的四個諾貝爾化學獎

Registration Period: 6 October – 21 October

Talk 2: 18 November 2022, Friday (Cantonese)

4:00 – 5:00 pm

Prof. Chai Mei Jimmy Yu

Photocatalytic Air Purification

光觸媒空氣淨化

Registration Period: 27 October – 11 November

Talk 3: 9 December 2022, Friday (Cantonese)

4:00 – 5:00 pm

Prof. Kee Pui Dennis Ng

Photodynamic Therapy – Principle, Applications and Challenges

光動力療法 – 原理，應用及挑戰

Registration Period: 17 November – 2 December

Live on ZOOM Webinar

Targets: Senior science secondary school student (S.4 – S.6)

Free Registration: <https://bit.ly/39DZYex>

Enquiry: Department of Chemistry,
The Chinese University of Hong Kong
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QR Code for
Registration



香港中文大學

The Chinese University of Hong Kong

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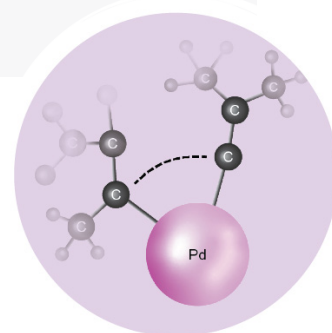
Talk 1: 28 Oct 2022 (Friday)

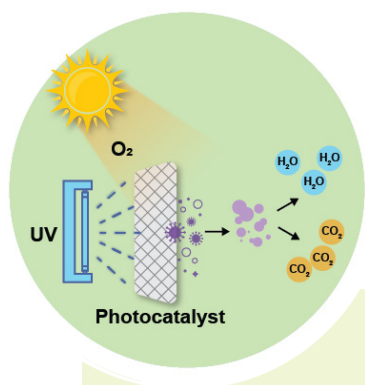
Innovative Catalysis: 4 Nobel Prizes in Chemistry within 20 Years

Prof. Fuk Yee Michael Kwong

Science is often full of imagination. In view of genuine benefit of mankind, it is our dream to make every chemical process of delivering desirable products in a speedy way. In fact, traditional molecular assembly is usually tedious and requires a number of synthetic steps. To tackle this problem in a sustainable way, catalysis is the rule of thumb choice. The outcome of these inventions should allow us having atom economy and realizing energy saving. The 2001 Nobel Laureates in Chemistry demonstrated ever efficient protocols for attaining chiral molecules which are highly useful in pharmaceutical sciences. The 2005 and 2010 Nobel Laureates in Chemistry established transition metal-catalyzed methods for olefin metathesis (chemical bond rearrangement) and aromatic bond construction, respectively. Very recently, the Nobel Laureates in Chemistry in 2021 displayed the speeding up of chemical transformation even without precious transition metals. These extraordinary important research outcomes had been highly recognized by Nobel prizes within the last 20 years. The significance of these frontier catalysis sciences will be discussed in a layman language.

科學往往充滿想像力。從真正造福人類的角度出發，我們的夢想是讓每一個化學過程都能快速提供理想的產品。事實上，傳統的分組裝通常很繁瑣，需要許多合成步驟。為了以可持續的方式解決這個問題，催化是經驗法則的選擇。這些發明的成果應該讓我們擁有原子經濟並實現節能。2001年諾貝爾化學獎獲得者展示了獲得在製藥科學中非常有用的手性分子的有效方案。2005年和2010年諾貝爾化學獎獲得者分別建立了過渡金屬催化烯烴複分解（化學鍵重排）和芳香鍵構建的方法。最近，2021年諾貝爾化學獎獲得者展示了即使沒有貴重過渡金屬，化學轉化的速度也會加快。這些非凡的重要研究成果在過去20年裡得到了諾貝爾獎的高度認可。這些前沿催化科學的意義將以易懂的語言進行討論。





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Talk 2: 18 Nov 2022 (Friday)

Photocatalytic Air Purification

Prof. Chai Mei Jimmy Yu

Demand for air purifiers has been high since the onset of the COVID-19 pandemic. Most air purifiers are simple filtration systems designed for collecting airborne particles including pathogens. While effective in reducing the airborne transmission of COVID-19, this filtration approach is just “pollution transfer”. The final disposal of all these used filters is a potential environmental and health hazard. The more advanced air cleaners usually add a UV-C lamp to control the pathogens. Since a UV source is already there, it would be a good idea to go one step further for photocatalytic air purification. The basic principle and the advantages of doing so will be discussed in this talk.

自 2019 冠狀病毒病疫情以來，市場對空氣淨化的需求持續高企。市面上大部分的空氣淨化機都是使用簡單的過濾系統，以分隔空氣中包括病原體在內的懸浮粒子。縱然這種方法能有效減低 2019 冠狀病毒病的空氣傳播，但在實際運作上只是將病毒轉移到濾芯，在棄置濾芯時有可能會對環境及公眾健康構成威脅。比較先進的空氣淨化機通常會用紫外線 C 進行消毒，以控制病原體。既然已應用了紫外線技術，或許更理想的是進一步發展光觸媒空氣淨化方案。這次演講將會討論光觸媒空氣淨化的原理及優點。



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Talk 3: 9 Dec 2022 (Friday)

Photodynamic Therapy – Principle, Applications and Challenges

Prof. Kee Pui Dennis Ng

Photodynamic therapy (PDT) is an innovative treatment modality for some localised and superficial cancers, as well as certain non-cancerous conditions. The treatment involves the combined action of three individually non-toxic components, namely a photosensitive drug, light of an appropriate wavelength and the endogenous oxygen to generate reactive oxygen species that can damage the cancer cells and tumour tissues. In this talk, the basic principle and current status of PDT will be introduced, including the challenges and the different strategies to tackle these problems.

光動力療法用於治療在特定範圍內的表淺性癌症及其他非癌症疾病。這種療法需要感光性藥物，適當波長的光和內源性氧分子這三種元素，以製造出活性氧類並破壞癌細胞及腫瘤組織。這次演講將會介紹光動力療法的基本原理及現狀，並探討這種療法所面對的挑戰以及其相應的應對策略。

