

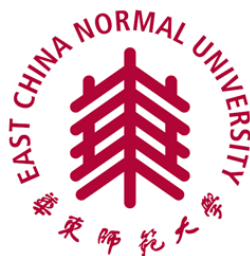
# A Journey on the Road for Synthesizing Our Future

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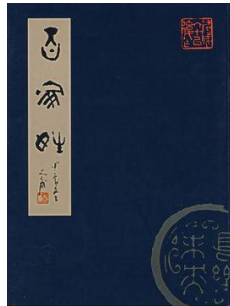
04-02-2017

# 1) Who Am I?

a) My Family Name: Cao (曹, Descendant of a king's son in ancient China)



曹叔振铎 (~B. C. 1000)



Hundred Family Surnames

- Top 27 family names in China
- About 7.3 million
- Accounting for 0.59% of the total population

b) My First Name: Zhong-Yan (中艳, The prosperity of my country)

## 2) Where I Come From?



1994-1999: Primary School



1999-2002: Junior High School


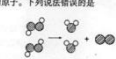
# My Basic Impression About Chemistry (2001-2002)



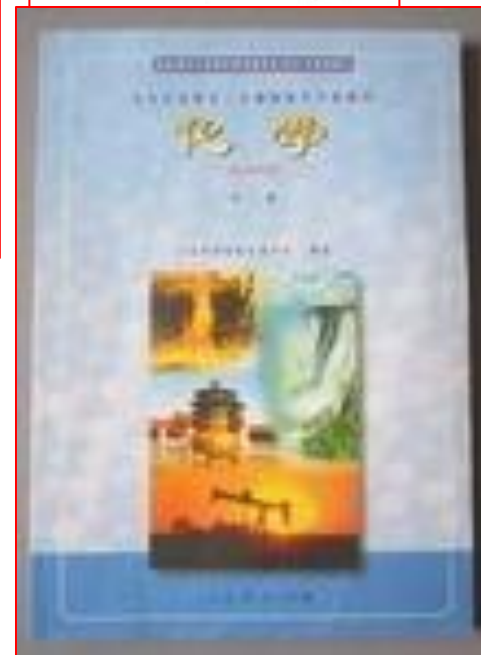
化学部分 (70分)

可能用到的相对原子质量: H-1 C-12 O-16 Cl-35.5 Ca-40

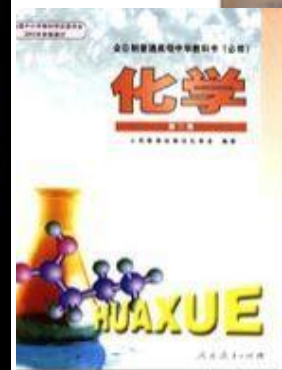
一、选择题(本题包括10小题,每小题2分,共20分。每题只有一个选项符合题意)

- 下列物质属于混合物的是  
A. 铁 B. 石油 C. 氯化钾 D. 硝酸钾
- 下列生活用品所用的主要材料,属于有机合成材料的是  
A. 塑料保鲜膜 B. 真丝围巾 C. 麻布袋 D. 木桶
- 下列有关物质的用途,利用了物理性质的是  
A. 用稀硫酸除铁锈 B. 用氢气作燃料  
C. 用熟石灰改良酸性土壤 D. 用干冰人工降雨
- 2013年,我省兰州市城区环境空气质量优良天数达到299天,优良率为81.92%,历史性地退出了全国空气质量十大污染城市行列。现行空气质量日报中,未计入空气污染指数项目的是  
A. SO<sub>2</sub> B. NO<sub>2</sub> C. CO<sub>2</sub> D. 可吸入颗粒
- 合理膳食是我们的健康理念。中考期间,小明妈妈为他准备了一份午餐:馒头、红烧肉、豆腐汤、炸鸡腿。你认为这份午餐搭配中还应添加下列食品中的  
A. 黄瓜 B. 牛奶 C. 炒鸡蛋 D. 烤鸭兔肉
- 2014年4月14日,科学家的詹姆斯·克拉克麦克斯韦向人们展示了一款真正意义上的原子手表,它内置了一个芯片级的铯原子钟,与1000年仅有1秒的误差。已知这种铯原子核内质子数为55,相对原子质量为133,则其核外电子数为  
A. 188 B. 78 C. 55 D. 23
- 下列图中所示的实验操作正确的是  

- 右下图为某反应的微观示意图,不同的球代表不同元素的原子。下列说法错误的是  


综合试卷第5页(共8页)



### 3) My Education Background (High School: 2002-2005)



2002-2005: Junior High School

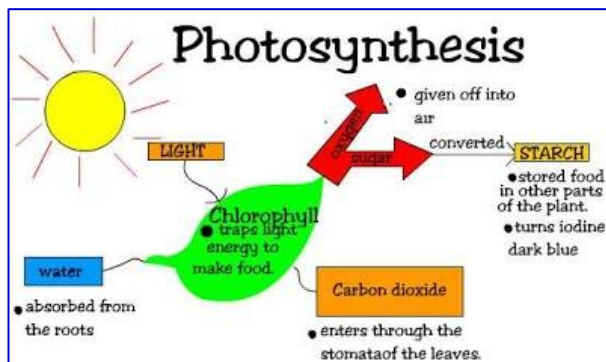


# Some Most Important Things I Remembered ....

1) We rely on **Synthetic chemistry** in daily life.



2) The Problem of **Energy Crisis** in the Whole World!



**SOS 能源危机 SOS, Energy Crisis**

在人口膨胀、石油、天然气资源量为世界平均水平的60%、10%和20%、我国石油的进口量将突破2亿吨。并以高速增长“百亿吨”大关。煤炭还可开采100年。天然气还可开采50年。石油开采仅剩40年！

**使用太阳能能源，人类共同的责任**  
Solar Energy Application, Global Responsibility

太阳能能源的利用，将成为人类未来发展的必由之路。太阳能能源是人类解决环境污染、能源短缺问题，以保护我们赖以生存的地球和环境。据计算使用一台容量为100升的太阳能热水器一年，等于少砍伐一棵大树，节约114公升标准煤的163立方米天然气，节约1748度电产生的热量，减少679公升二氧化碳的排放……

**中国高建筑能耗**  
Chinese High Energy-Consumption construction

中国每年新建建筑面积60亿平方米，总建筑面积600亿平方米。单位建筑面积能耗为美国的三倍以上。耗1000吨，我国建筑能耗将比10.80吨（1亿吨标准煤），用1000吨标准煤相当于10个三峡电站发电量。

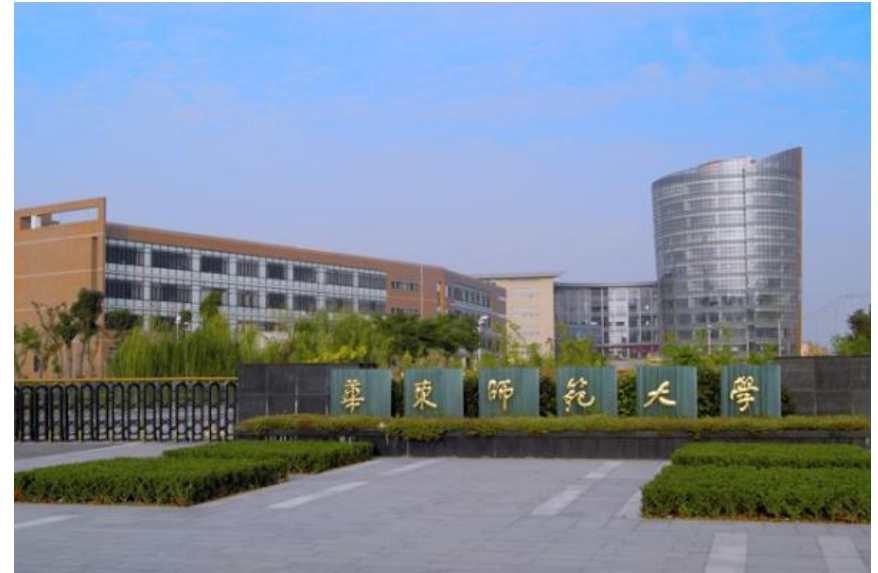
**太阳能新能源**  
New Energy, Solar Energy

太阳能是人类最慷慨的礼物。据统计，每小时太阳辐射到地球上的能量就相当于一千亿万度电。如果照射10分钟，便足以满足人类一年的能量需求。

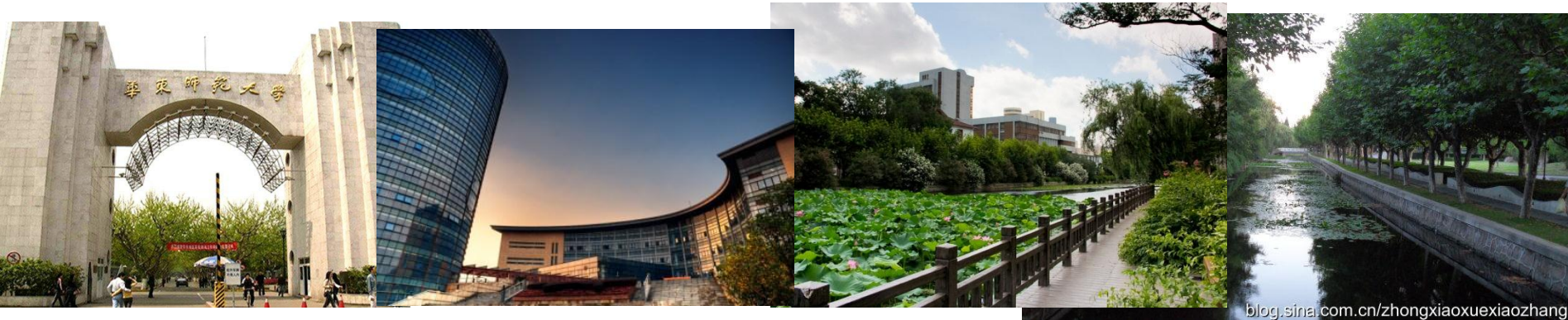
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### 3) My Education Background (Undergraduate to PhD: 2006-2015)

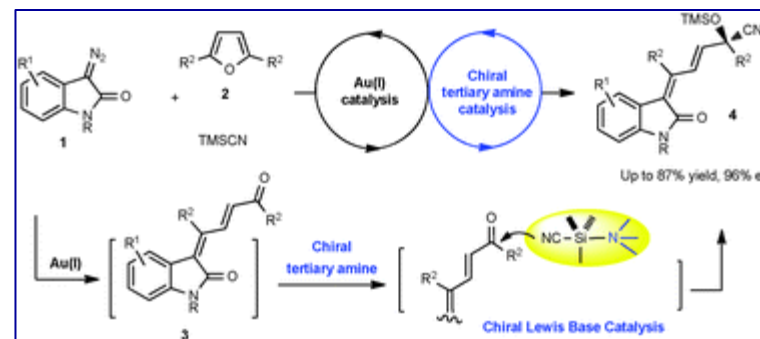
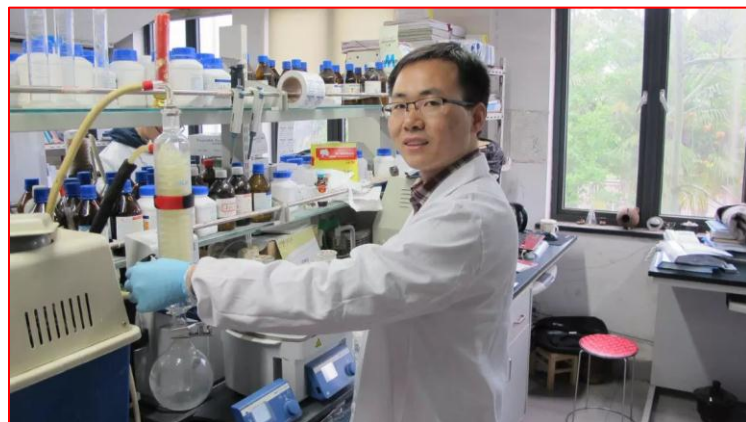
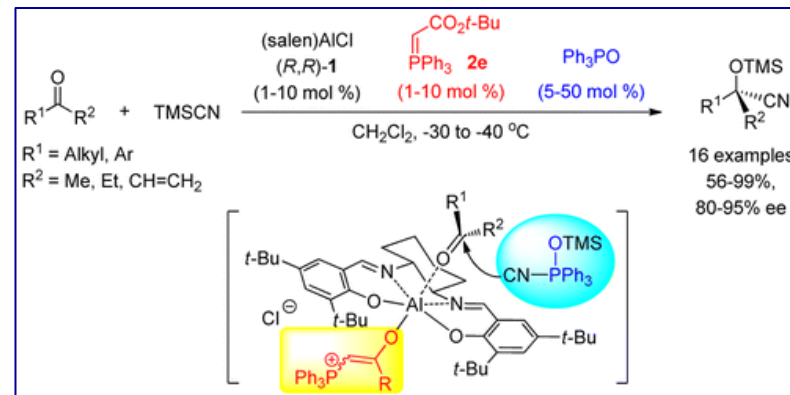
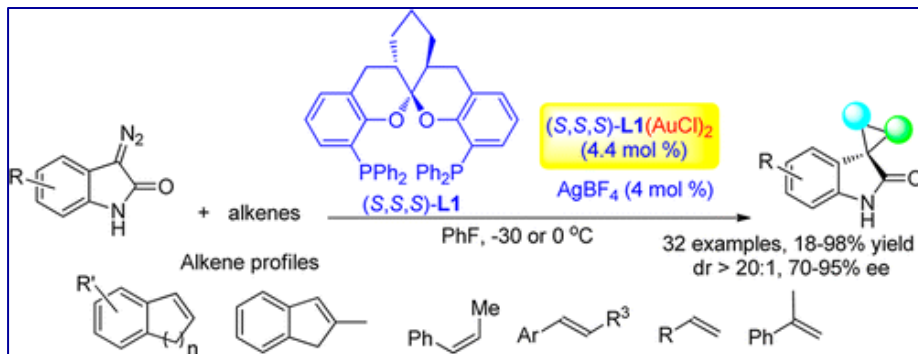


**East China Normal University  
(Top 30 in China)**



# 3) My Education Background (Undergraduate to PhD: 2006-2015)

## 1) Only Focusing on *Synthetic chemistry*: Developing New Catalysts for Making Useful Molecules





# 4) PostDoc Study (2016-now): Following the Heart, to Use Solar Energy



ICIQ Institut Català d'Investigació Química

PUBLICATIONS NEWS JOBS & GRANTS STAFF INTRANET

ABOUT US RESEARCH INDUSTRY TRAINING OUTREACH

## Research Prof. Paolo Melchiorre

Home / Research / Research Groups

- Group's home page
- Prof. Paolo Melchiorre
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### Discovery of New Enantioselective Organocatalytic and Photochemical Processes

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### Selected publications

Asymmetric catalytic formation of quaternary carbons by iminium ion trapping of radicals

J. J. Murphy, D. Bastida, S. Paria, M. Fagnoni, P. Melchiorre

Nature 2016, 532, 218-222

\*Highlighted in *Synfacts*, 2016, 12(07), 739

### News

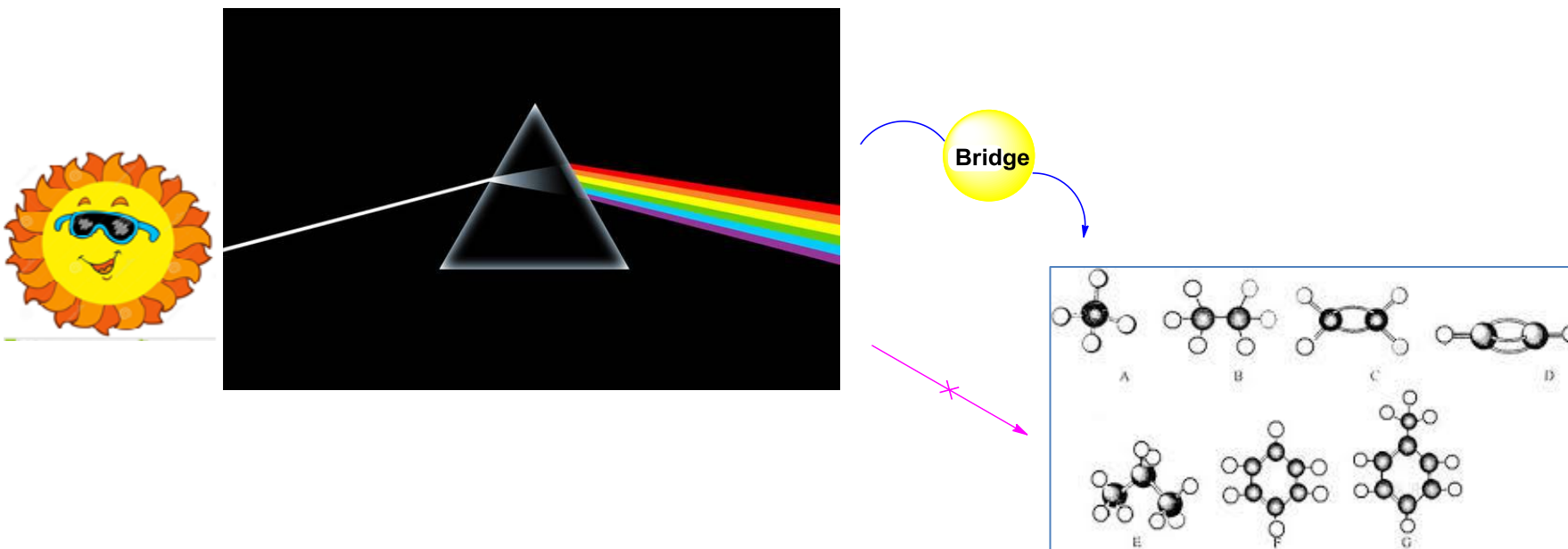
More news

October 10, 2016  
PHOTOTRAIN: A new ITN project

July 18, 2016

## One Main Problem in Photochemistry

**Most organic compounds does not absorb sunlight efficiently**

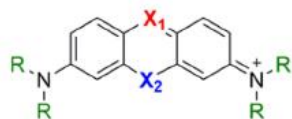
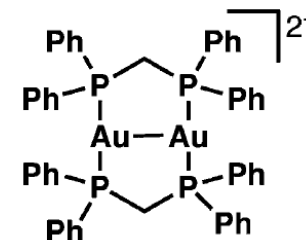
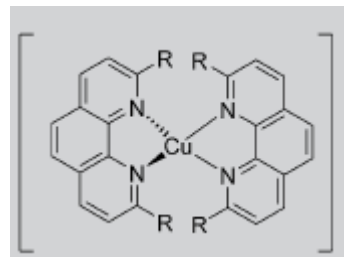
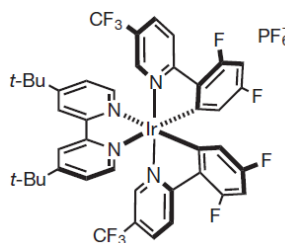
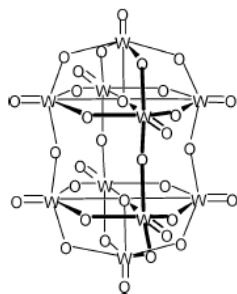
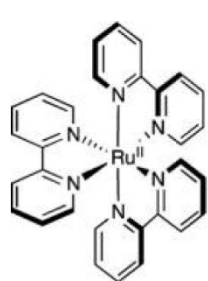


One Main Problem in Photochemistry:

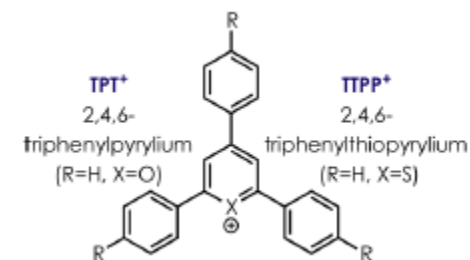
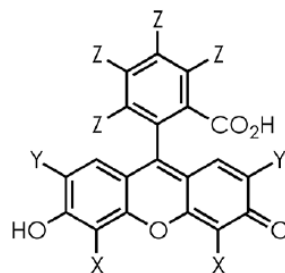
**How to utilize Light directly**



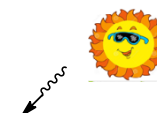
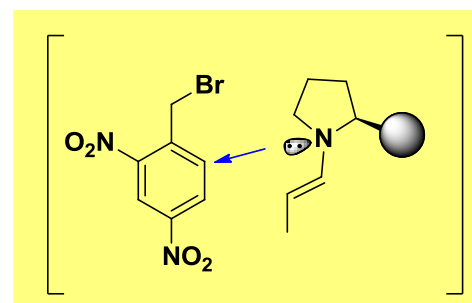
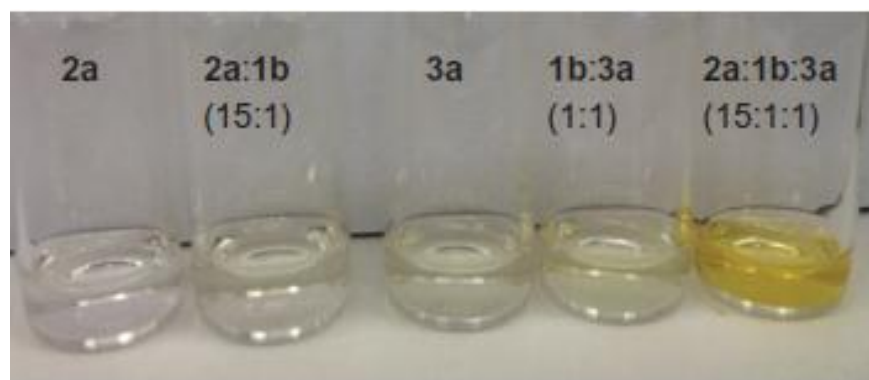
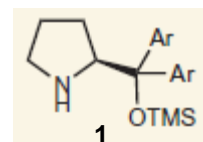
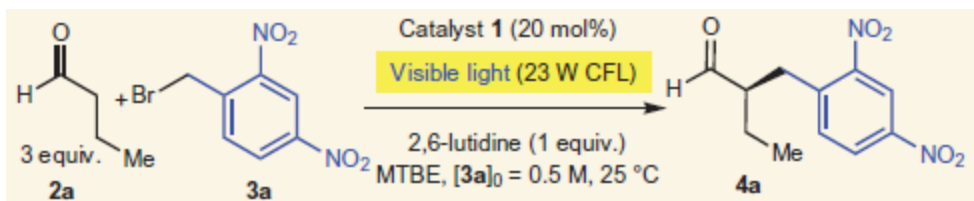
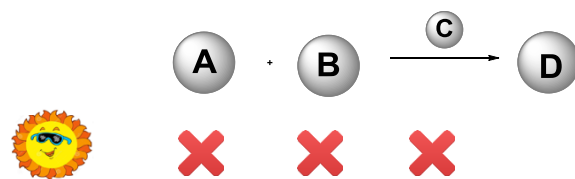
## 1) Some representative Photosensitizers (Photocatalysts)

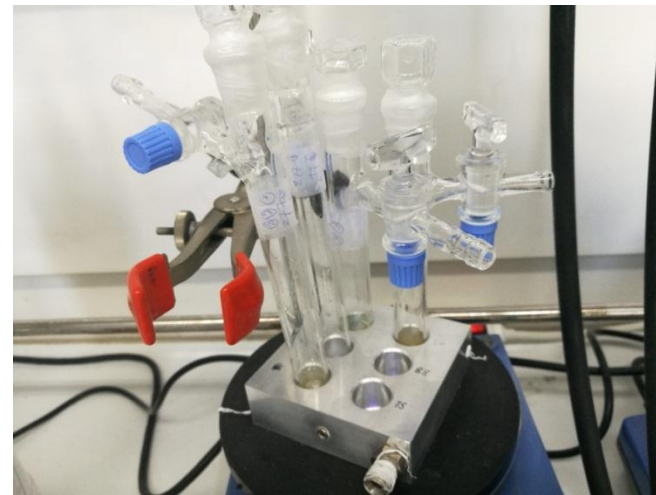
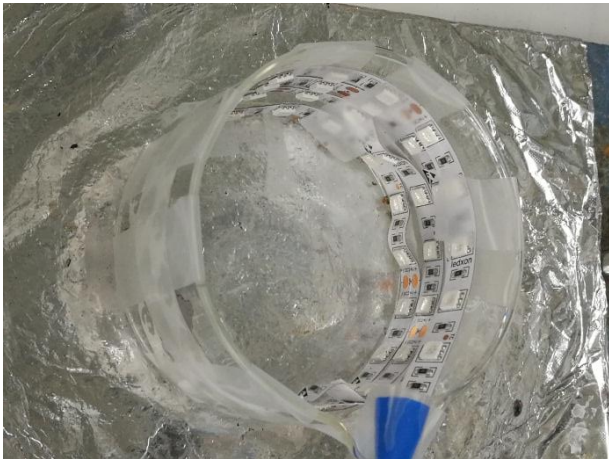


Thiazine Dyes:  $X_1 = N$ ;  $X_2 = S$   
 Oxazine Dyes:  $X_1 = N$ ;  $X_2 = O$   
 Xanthene Dyes:  $X_1 = C-Ar$ ;  $X_2 = O$   
 Azine Dyes:  $X_1 = N$ ;  $X_2 = N-Ph$   
 $R = H, Alkyl$



## 2) One of Our Strategy: Absorbing Light by forming Colored Complex





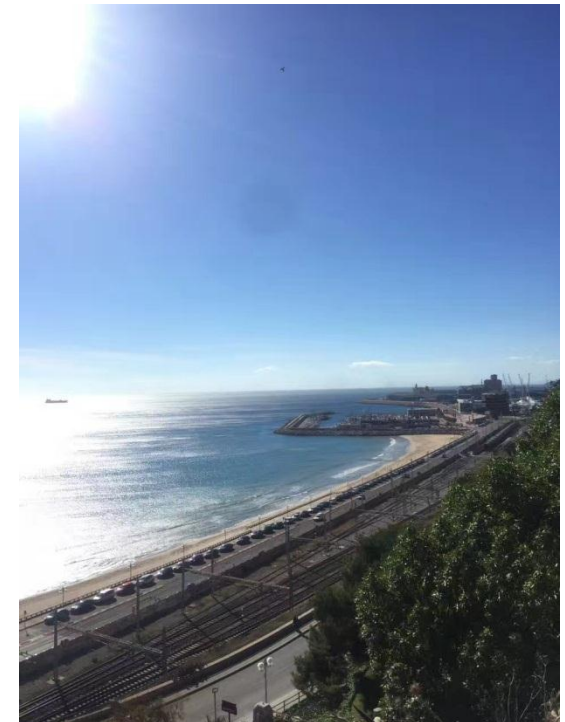
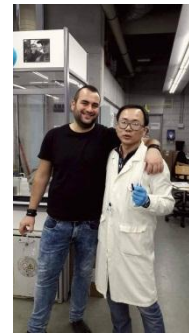
## 5) My Impression About Spain

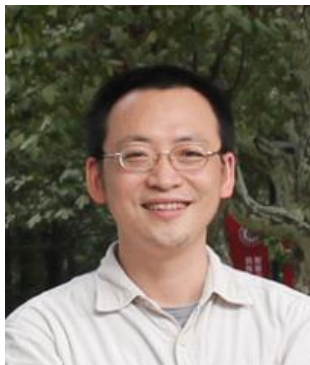
*Before I came here...*



# 5) My Impression About Tarragona, Spain

*Now...it's my second hometown*





**Prof. Dr. Jian Zhou**



**Prof. Dr. Paolo Melchiorre**

