A Journey on the Road for Synthesizing Our Future

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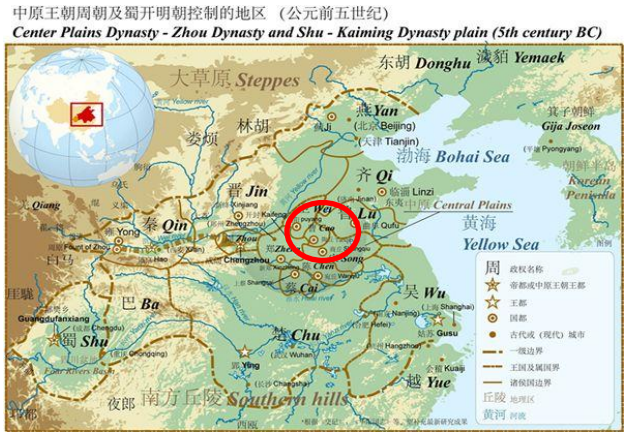
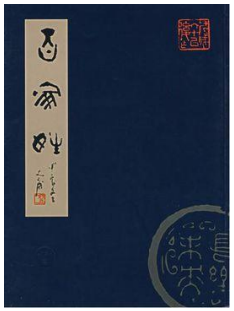
1) Who Am I?

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

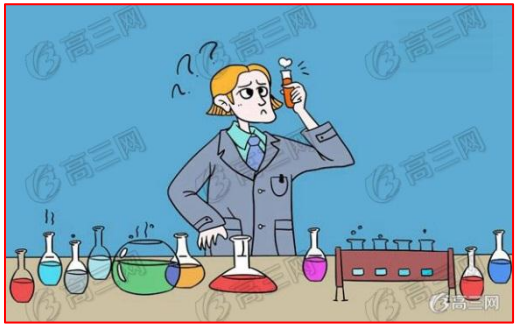
b) My First Name: Zhong-Yan (中艳，The prosperity of my country)

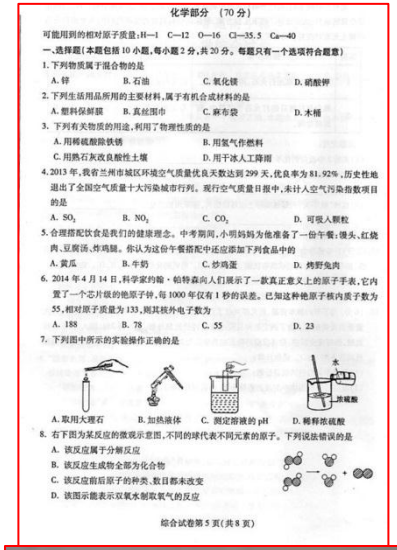
2) Where I Come From?

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）

1. 下列物质属于混合物的是
A. 锌 B. 石油 C. 氧化镁 D. 硝酸钾

2. 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

3. 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

4. 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_2 B. NO_2 C. CO_2 D. 可吸入颗粒

5. 合理搭配饮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. 烤野兔肉

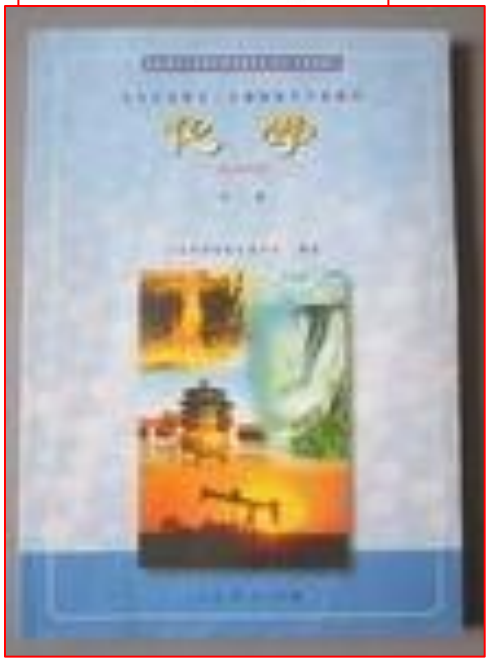
6. 2014 年 4 月 14 日，科学家约翰·帕特森向人们展示了一款真正意义上的原子手表，它内置了一个芯片级的绝原子钟，每 1000 年仅有 1 秒的误差。已知这种绝原子核内质子数为 55，相对原子质量为 133，则其核外电子数为
A. 188 B. 78 C. 55 D. 23

7. 下列图中所示的实验操作正确的是

A. 取用大理石 B. 加热液体 C. 测定溶液的 pH D. 稀释浓硫酸

8. 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
A. 该反应属于分解反应
B. 该反应生成物全部为化合物
C. 该反应前后原子的种类、数目都未改变
D. 该图示能表示双氧水制取氧气的反应

综合试卷第 5 页（共 8 页）

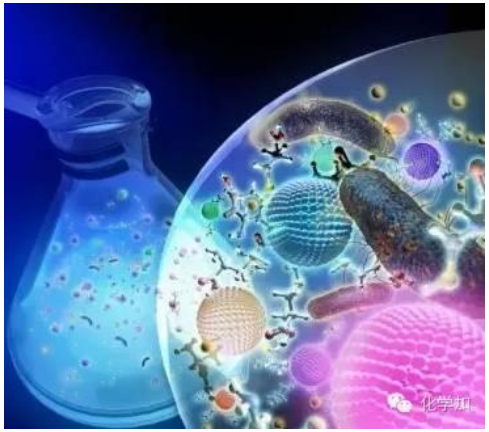


3) My Education Background (High School: 2002-2005)

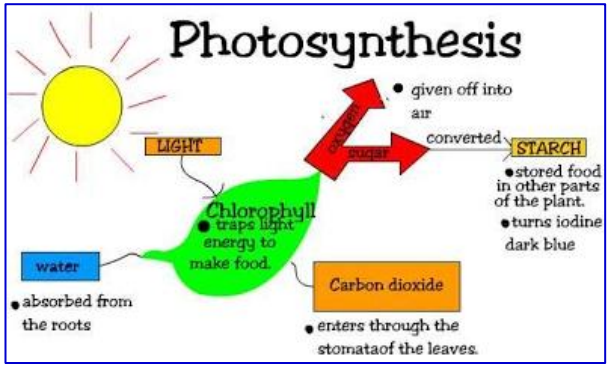
2002-2005: Junior High School

Some Most Important Things I Remembered ….

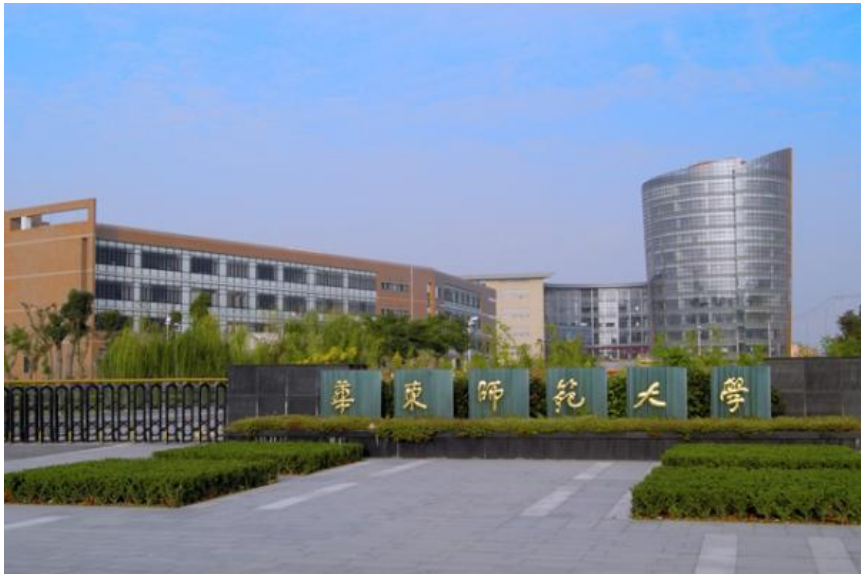
1) We rely on *Synthetic chemistry* in daily life.



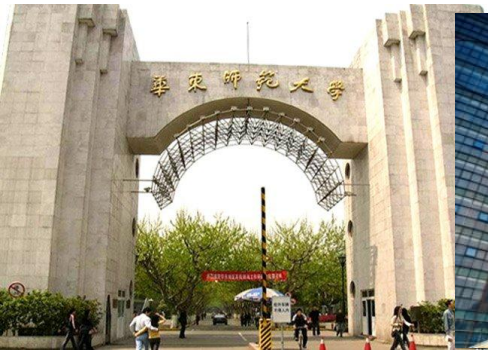
2) The Problem of *Energy Crisis* in the Whole World!

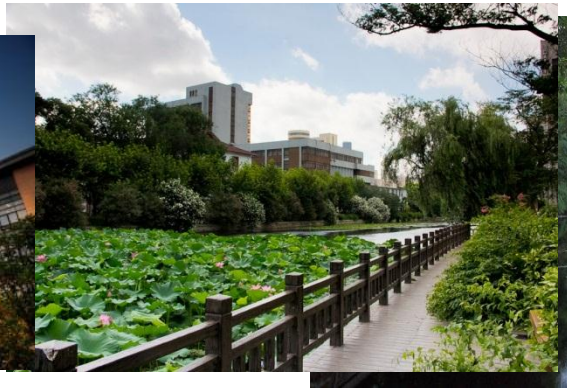


3) My Education Background (Undergraduate to PhD: 2006-2015)



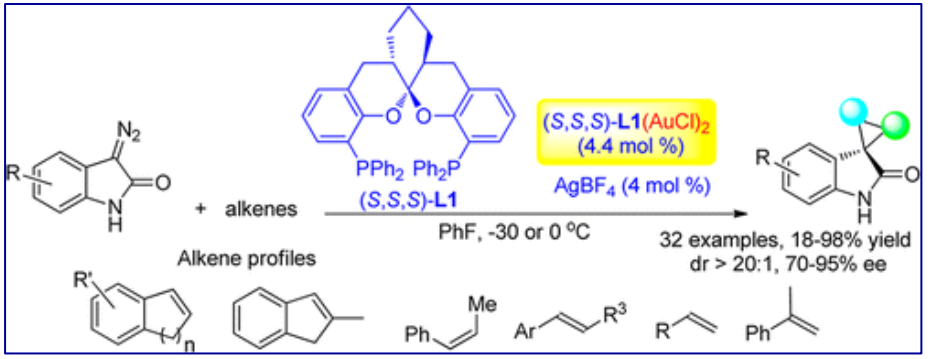
East China Normal University
(Top 30 in China)

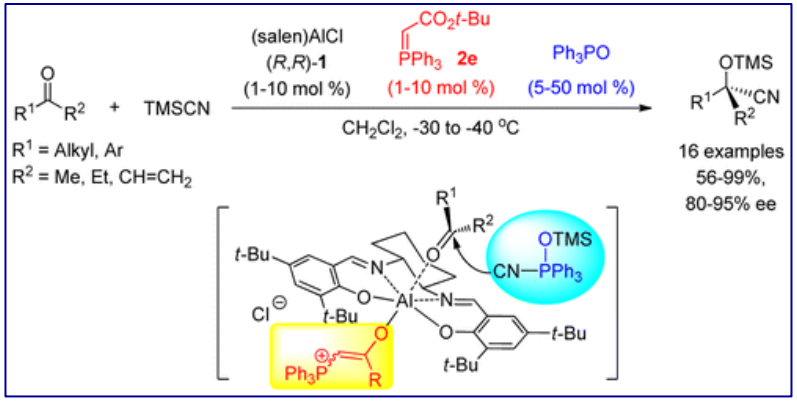


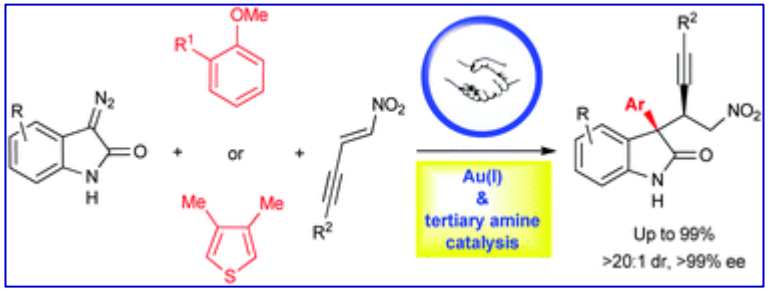


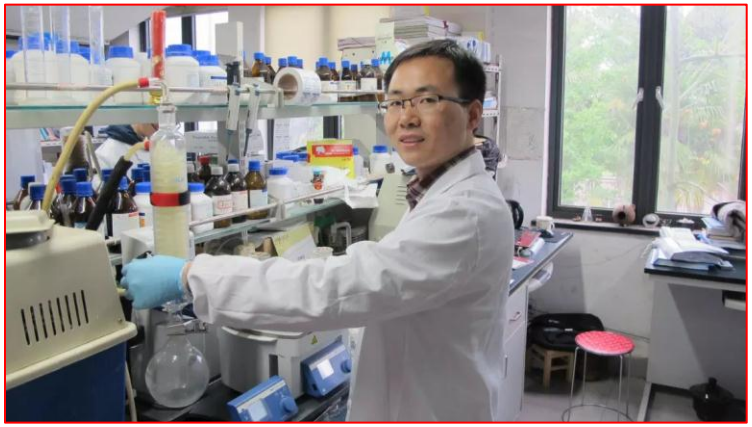
3) My Education Background (Undergraduate to PhD: 2006-2015)

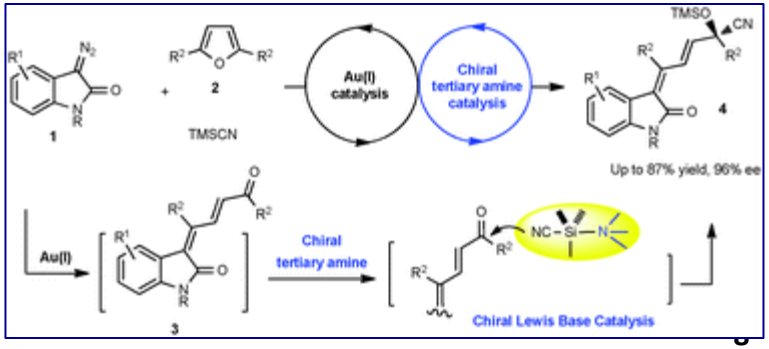
1) Only Focusing on *Synthetic chemistry*: Developing New Catalysts for Making Useful Molecules







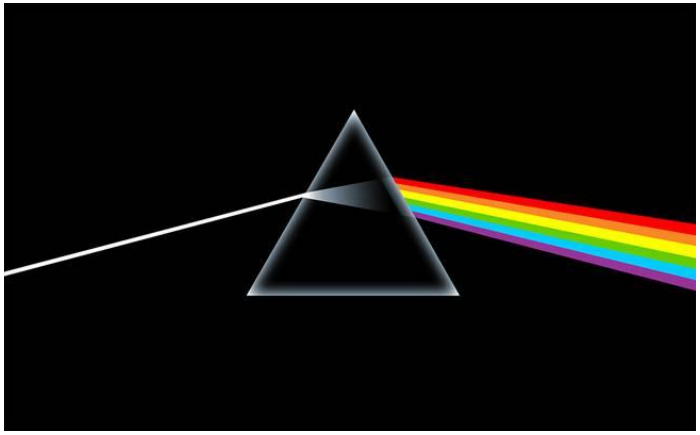


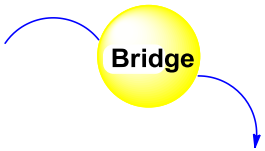


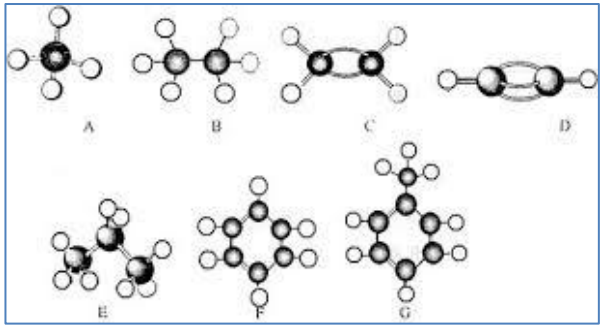
4) PostDoc Study (2016-now): Following the Heart, to Use Solar Energy

One Main Problem in Photochemistry

Most organic compounds does not absorb sunlight efficiently



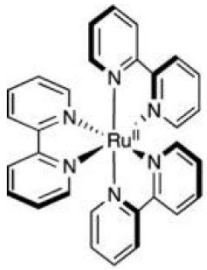


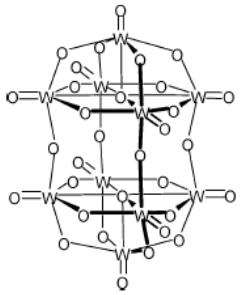


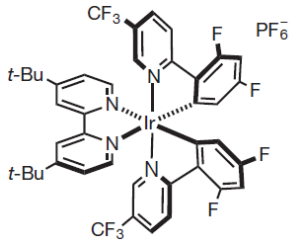
One Main Problem in Photochemistry:

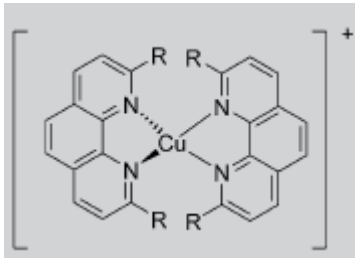
How to utilize Light directly

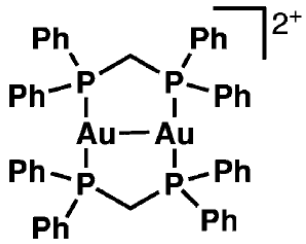
1) Some representative Photosensitizers (Photocatalysts)

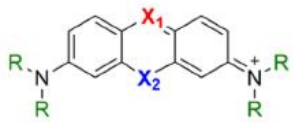




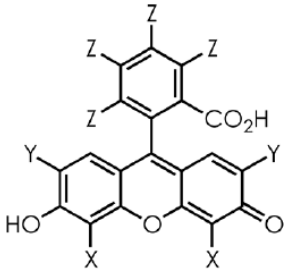


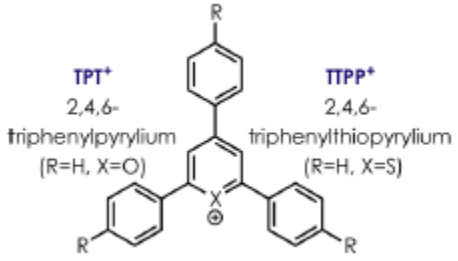




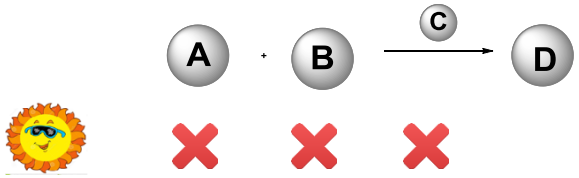


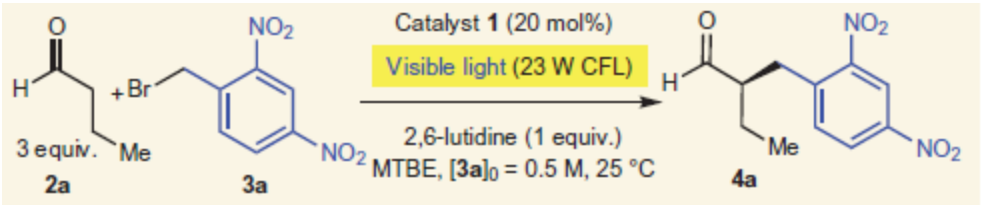
Thiazine Dyes: X_1 = N; X_2 = S
Oxazine Dyes: X_1 = N; X_2 = O
Xanthene Dyes: X_1 = C-Ar; X_2 = O
Azine Dyes: X_1 = N; X_2 = N-Ph
R = H, Alkyl

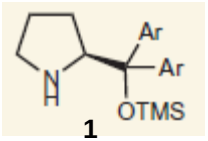


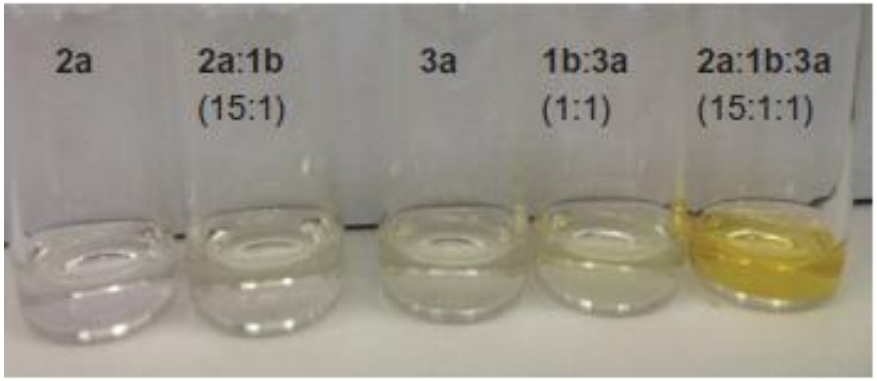


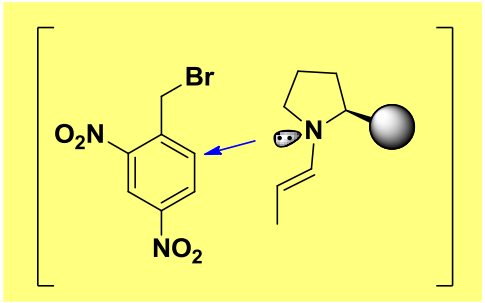
2) One of Our Strategy: Absorbing Light by forming Colored Complex



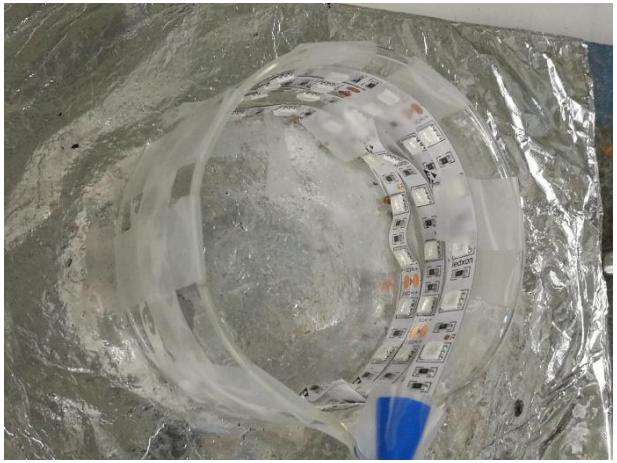


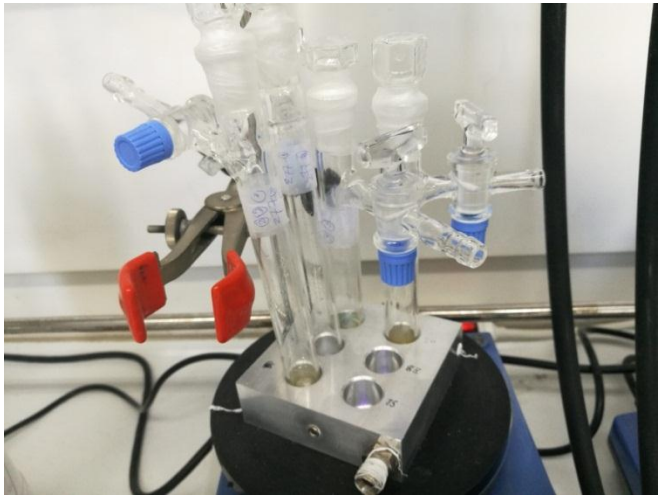






Various Light Sources in the Lab.



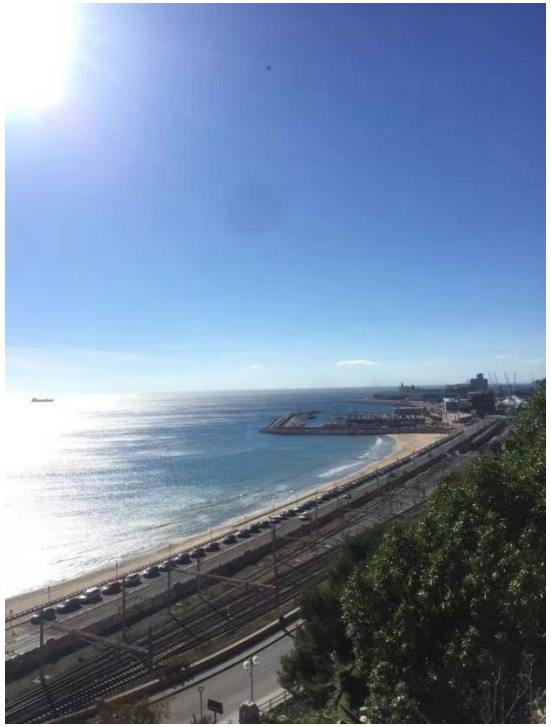


5) My Impression About Spain

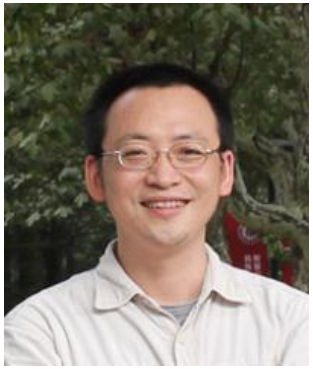
Before I came here…

5) My Impression About Tarragona, Spain

Now…it´s my second hometown



Acknowledgement



Prof. Dr. Jian Zhou

Prof. Dr. Paolo Melchiorre