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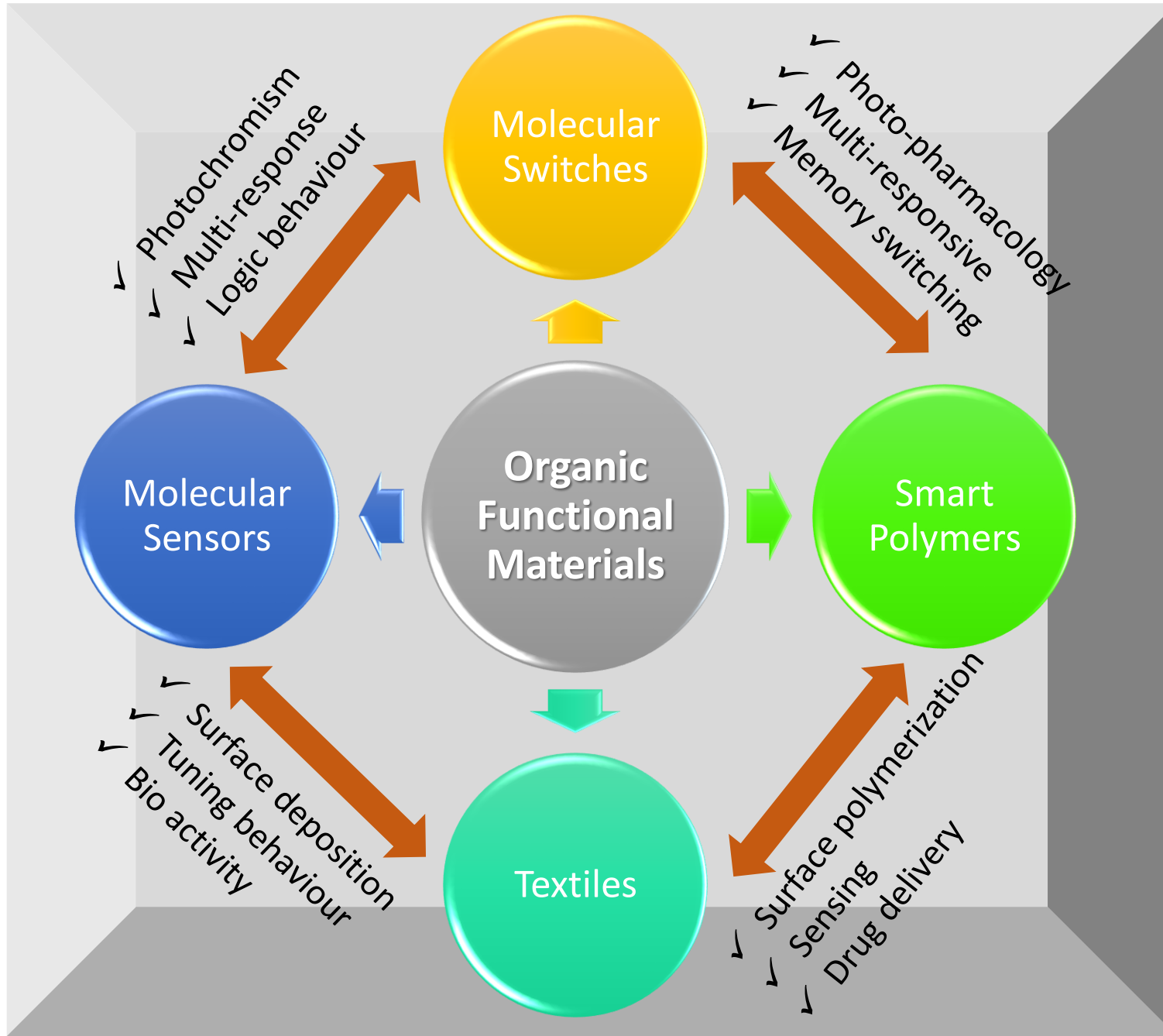
Organic Functional Materials

Part of the project №BG-RRP-2.004-0002, "BiOrgaMCT"



University of Chemical
Technology and
Metallurgy

70th years UCTM, 22 May 2023, Sofia
Laboratory of Organic Functional Materials



WP 1 Synthesis of Organic Materials

- *Design of new molecules*
- *Synthesis and purification*
- *Structure elucidation*

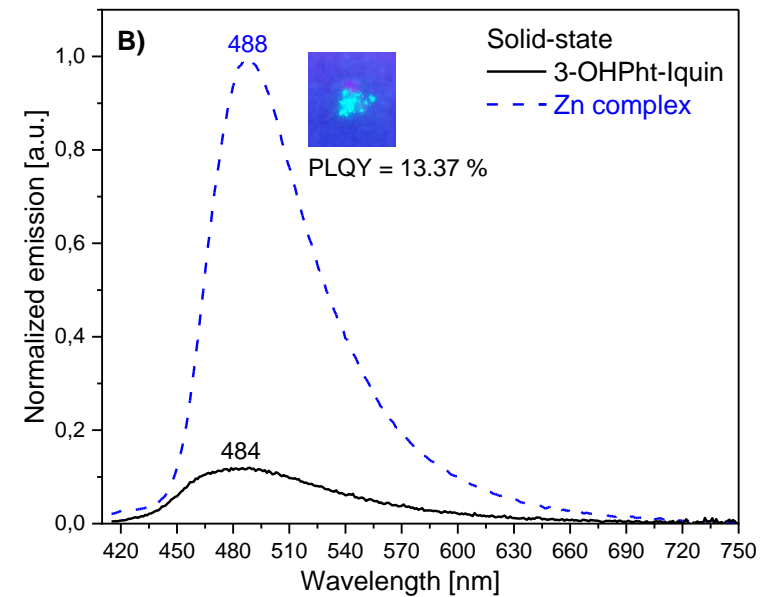
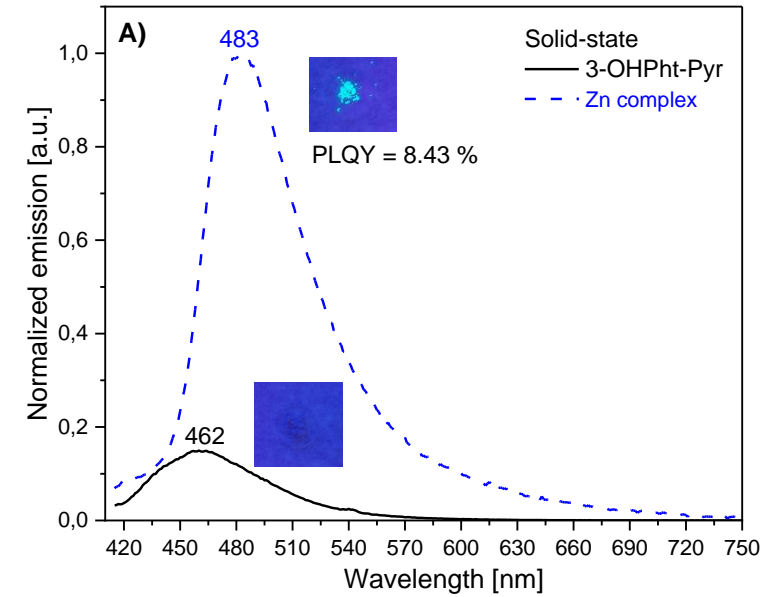
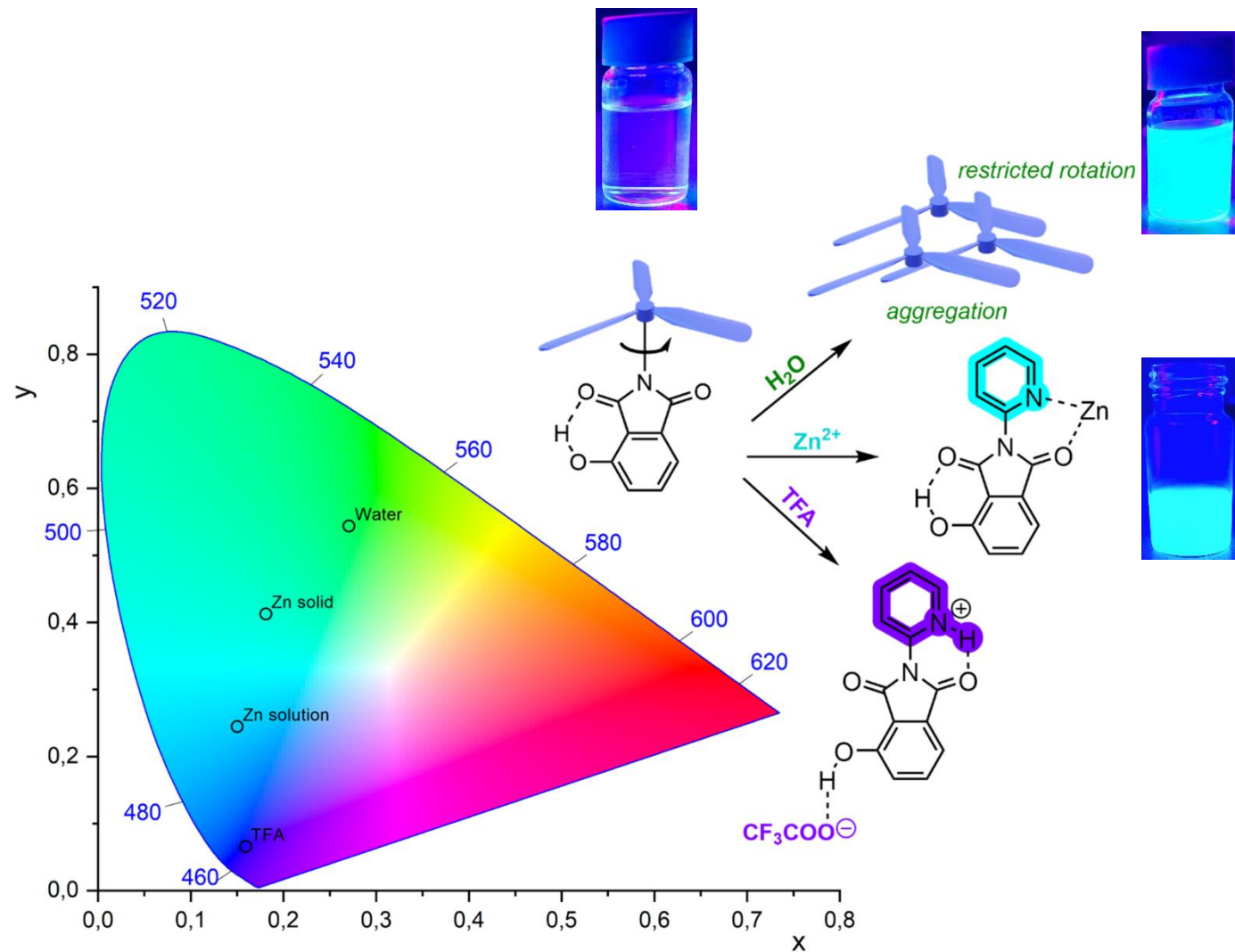
WP 2 Investigation of the Photophysical Properties

- *Steady-state and transient spectroscopy measurements*
- *Dynamic spectral measurements upon external stimuli*
- *Preparation of 1D and 2D solid-state materials*

WP 3 Study and Evaluation their Working Functions as Molecular Devices

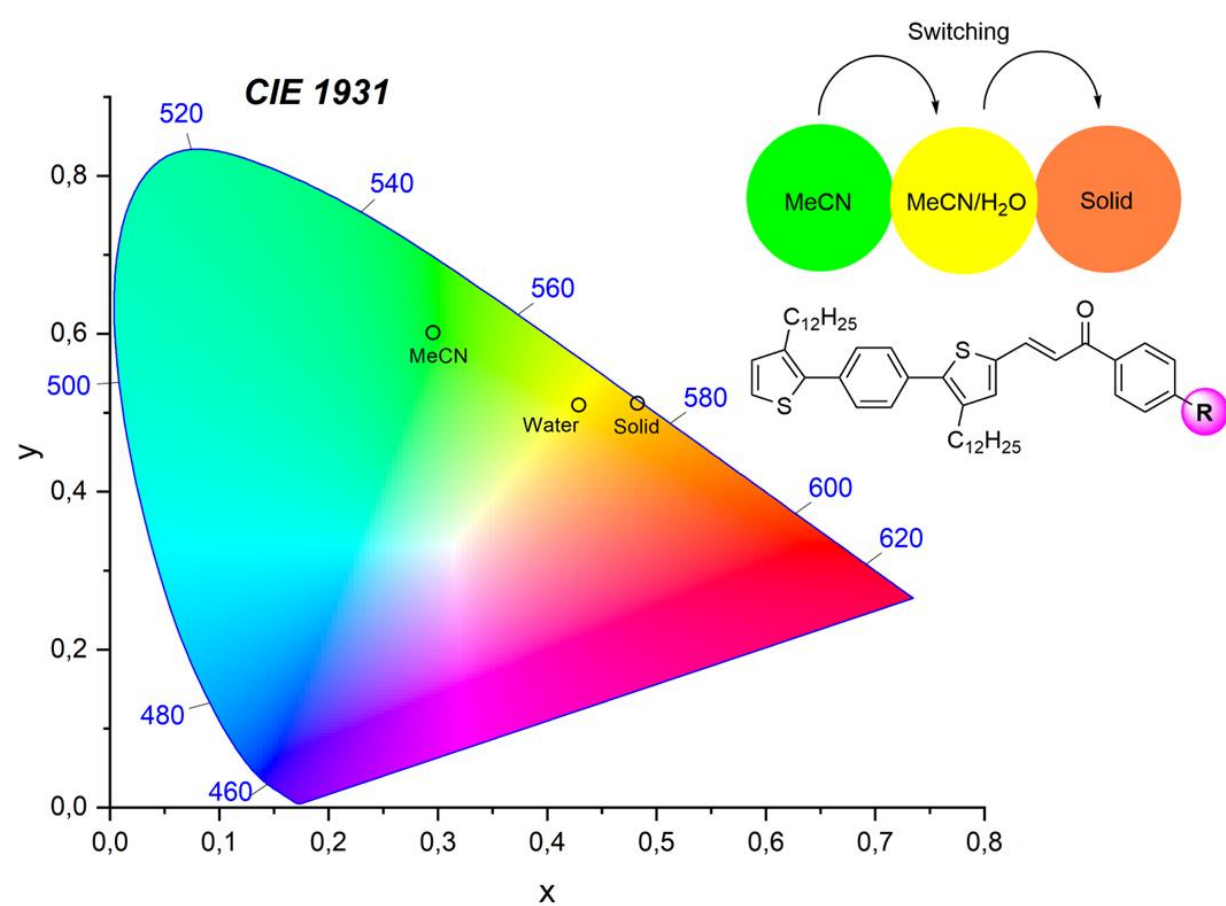
- *Solid-state performance of organic materials (thin films, bulk material, deposition of various substrates)*
- *Investigation microscopic characteristics by TEM, SEM, XRD*
- *Structure-properties relationship evaluation*

Main results

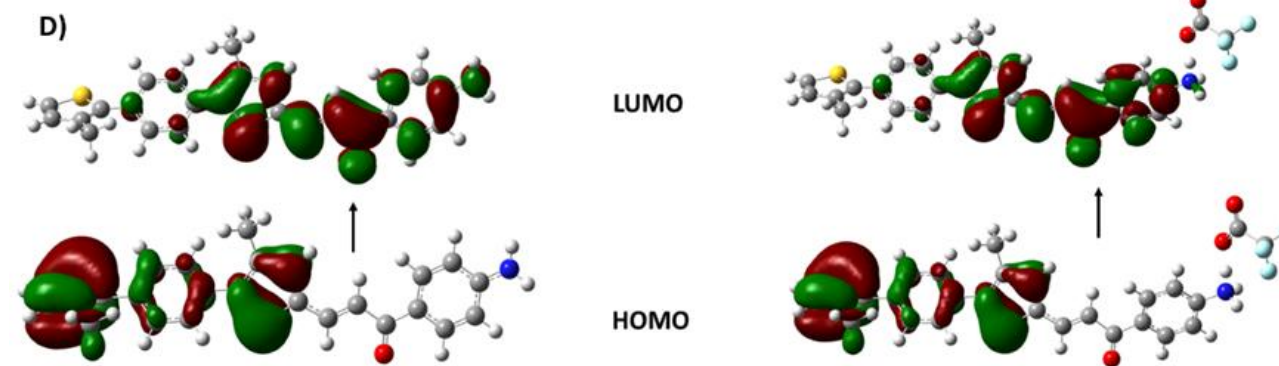
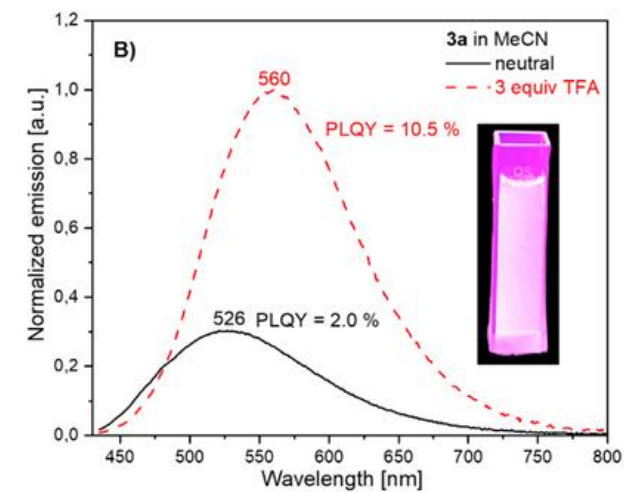
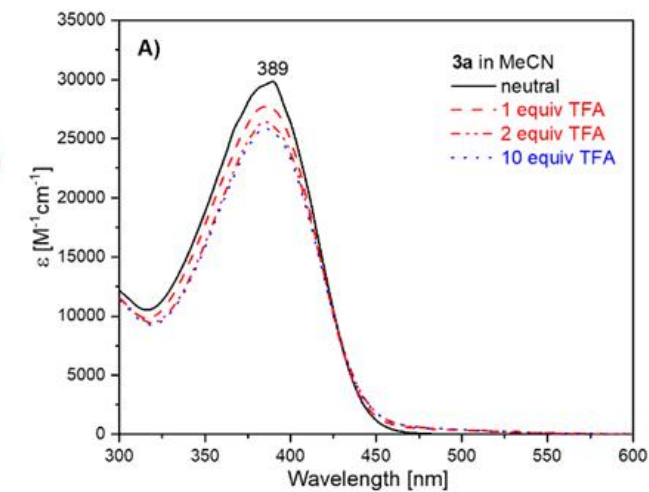
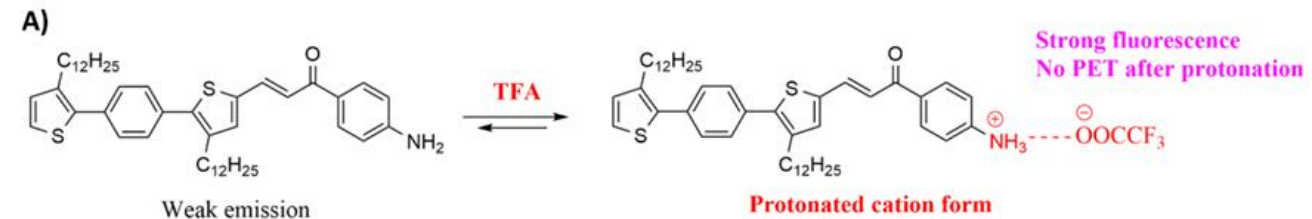


Rastislav Smolka, ..., Anton Georgiev, "Control over rotary motion and multicolour switching in 3-hydroxyphthalimide fluorophores: An interplay between AIE and ESIPT", *Dyes and Pigments*, Volume 215, 2023, 111279, <https://doi.org/10.1016/j.dyepig.2023.111279> , Q1

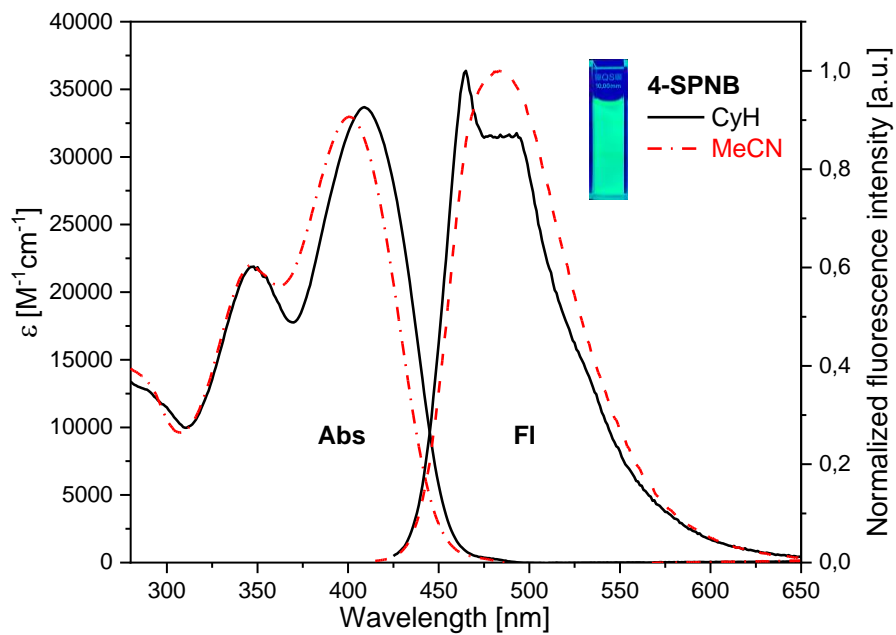
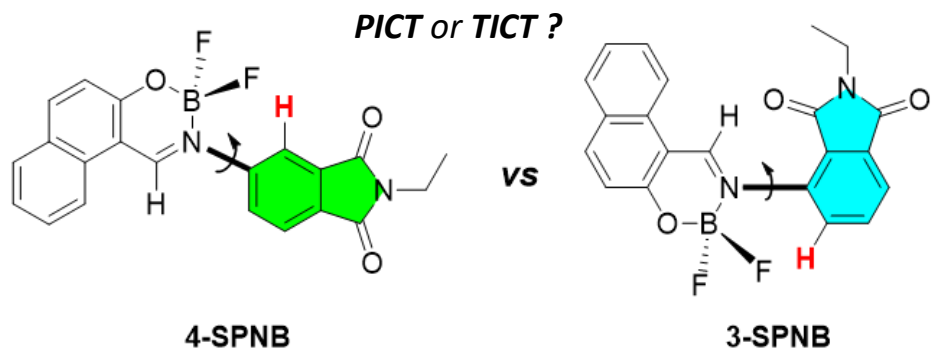
Main results



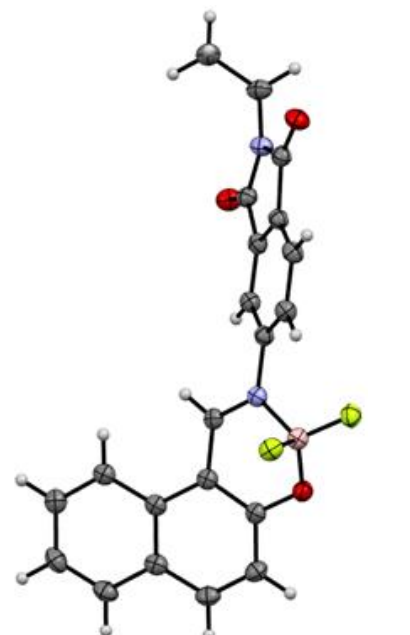
Dominik Veselý, ..., Anton Georgiev, "Acid-Base and AIEgen Fluorescence Switching of Phenylene-thienyl Chalcones", Preparing to the journal



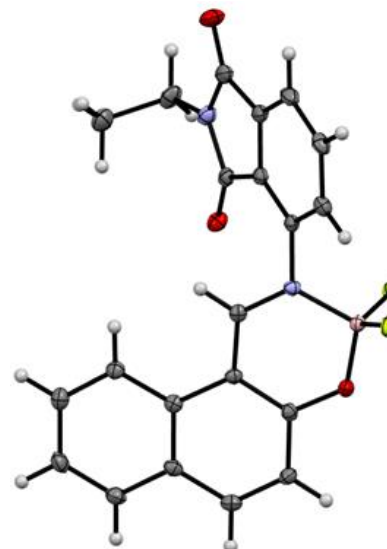
Main results



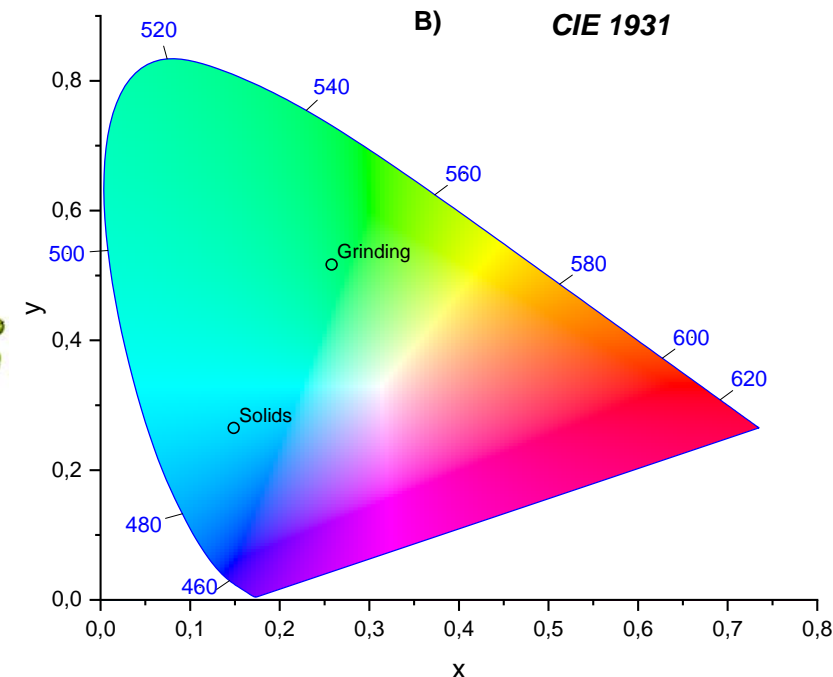
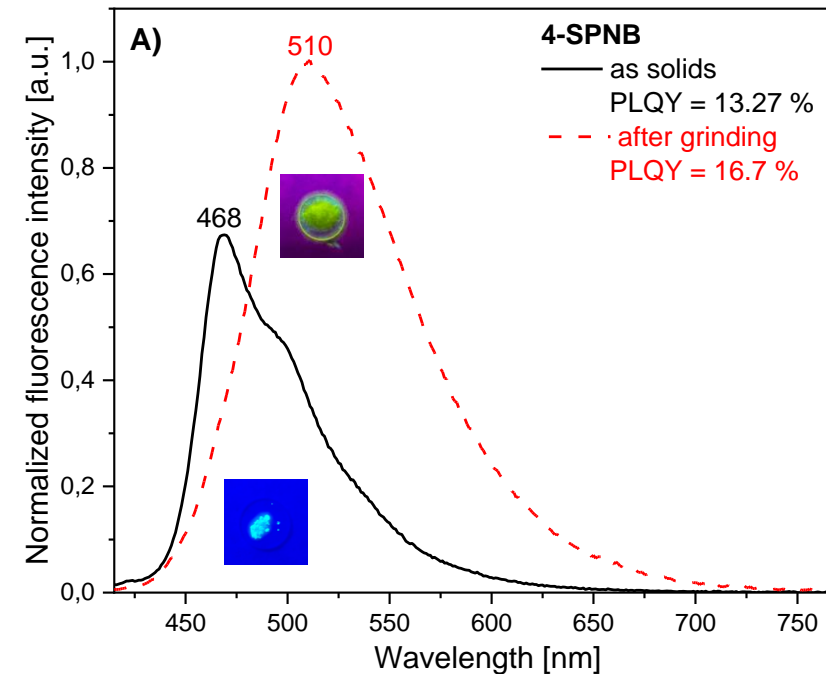
- ✓ **PLQY = up to 38 %**
- ✓ **TCSPC: prolonged lifetime up to 19 ns**
- ✓ **Two component in TRES**



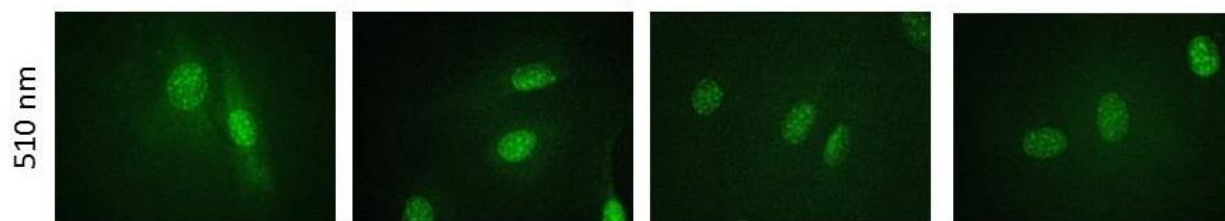
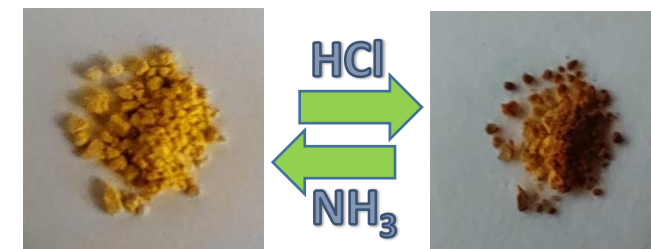
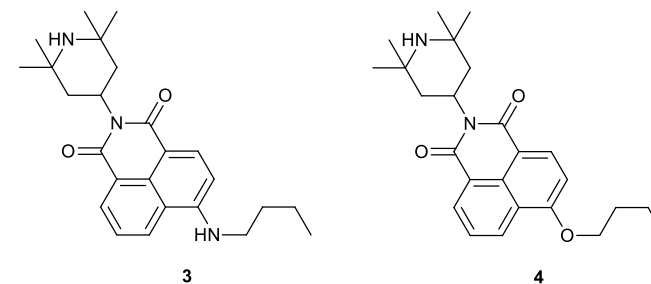
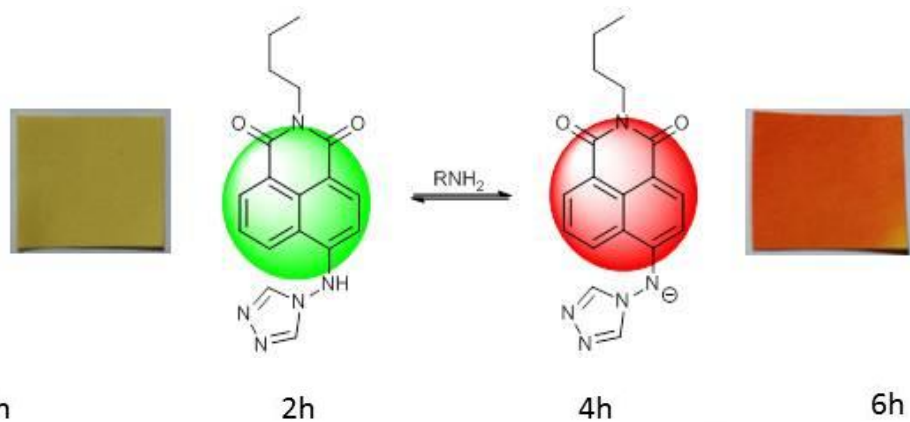
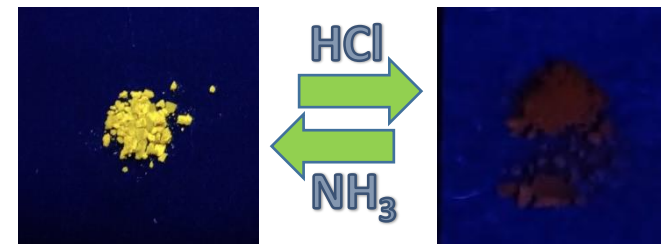
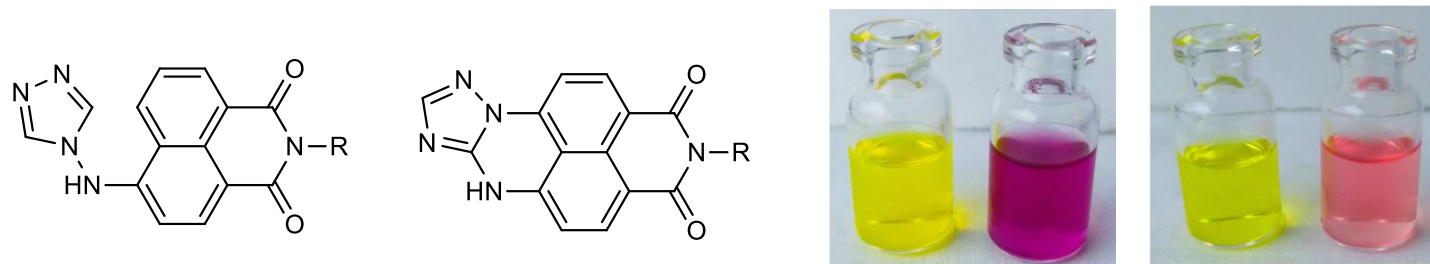
4-SPNB X-Ray Structure



3-SPNB X-Ray Structure



Main results



Ventsislav V. Bakov, Nikolai I. Georgiev, Vladimir B. Bojinov, "A yellow-green solid state emissive 1,8-naphthalimide for detection of acid vapors in turn-off mode and base vapors in turn-on mode", **Preparing to Photonics**

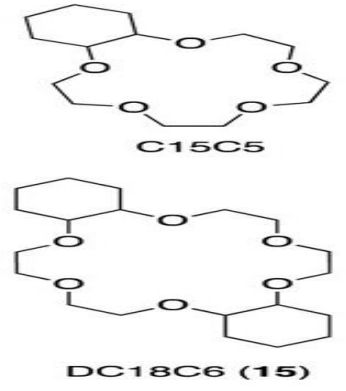
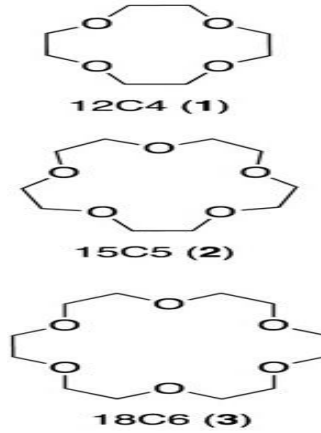
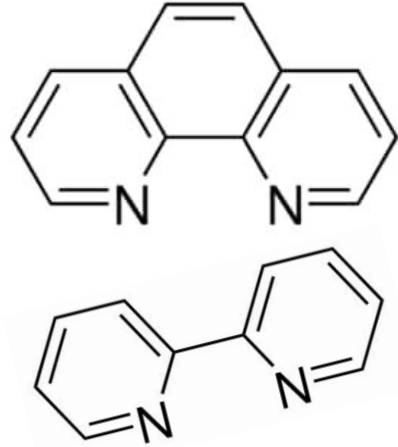
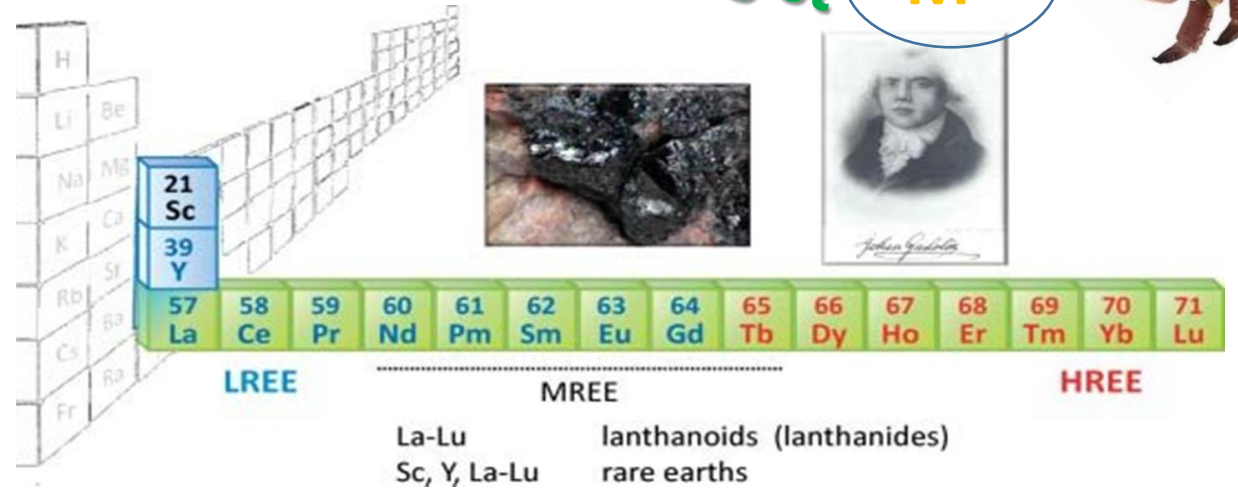
Nikolai I. Georgiev, Ventsislav V. Bakov, Vladimir B. Bojinov, "A tutorial review on the fluorescent probes as molecular logic circuit – Digital comparator", **Preparing to Molecules**

SOLVENT EXTRACTION OF METALS WITH FANCY LIGANDS

Chelating ligands + synergist



Mⁿ⁺



Модифициране на памучен плат с омрежени полимери

1. Модифициране на памучен плат с полиакриламид при вариране количеството на основния мономер-акриламид и омрежващия мономер

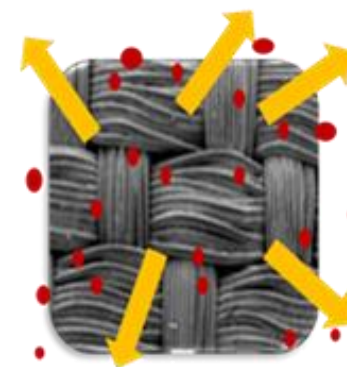
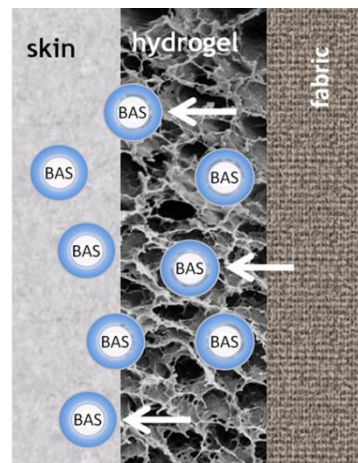
Цел: Да се изследва влиянието на получения хидрогел върху отделянето на биологично активното вещество (БАВ или BAS) с времето

Приложение

При заболявания и наранявания на кожата

Козметичен текстил

Трансдермално приложение на БАВ

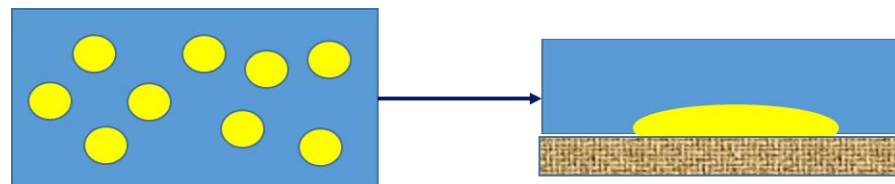


1. Десорбция на БАВ от повърхността на хидрогела

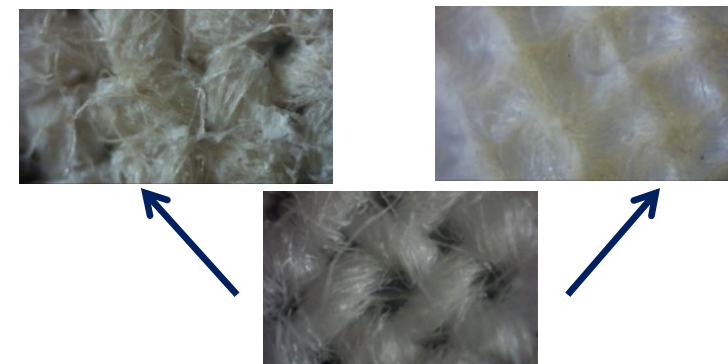
2. Набъбване на хидрогела и дифузия на БАВ

2. Получаване на композитен материал от памучен плат с хидрофобни и олиофилни свойства

Цел: Приложение на материала при отстраняване на нефт и нефтопродукти от вода.



хидрофобен-олеофилен материал



памучен плат

The results are developed as part of contract №: BG-RRP-2.004-0002-C01, **Laboratory of Organic Functional Materials** (Project BiOrgaMCT), Procedure BG-RRP-2.004 “Establishing of a network of research higher education institutions in Bulgaria”, funded by BULGARIAN NATIONAL RECOVERY AND RESILIENCE PLAN

Thank you very much

TEAM

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Dr. Desislava Grabcheva – Senior Researcher

Dr. Rayna Bryaskova – Senior Researcher

Dr. Daniela Angelova-Atanassova - Junior Researcher

Vencyslav Bakov – Junior Researcher