

Phosphorus containing conjugated molecules with efficient fluorescence

20 Years of cooperation Budapest - Rennes



László Nyulászi



Muriel Hissler



Régis Reau

French-Hungarian bilateral research conference Institut Francais 28. 09. 2018

Joint Tét - Balaton projects

2004-2006 Regis Reau – László Nyulászi,

2009-2011 Regis Reau – László Nyulászi,

2013 – 2015 Muriel Hissler– László Nyulászi

2017-2018 Pierre-Antoine Buoit – Zoltán Benkő

CNRS/PICS

2018-2020 Muriel Hissler – László Nyulászi

Rózsa Szűcs PhD 2017,

Réka Mokrai

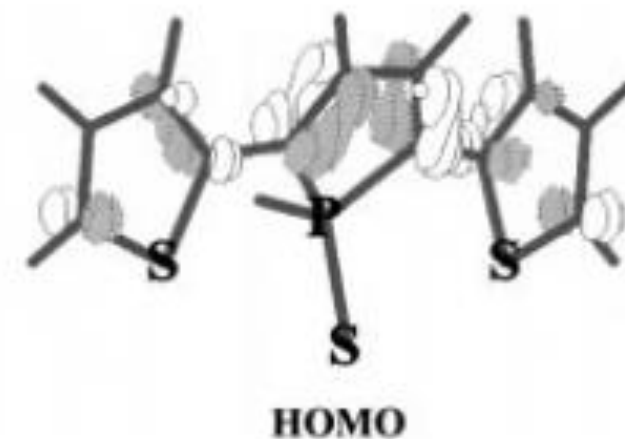
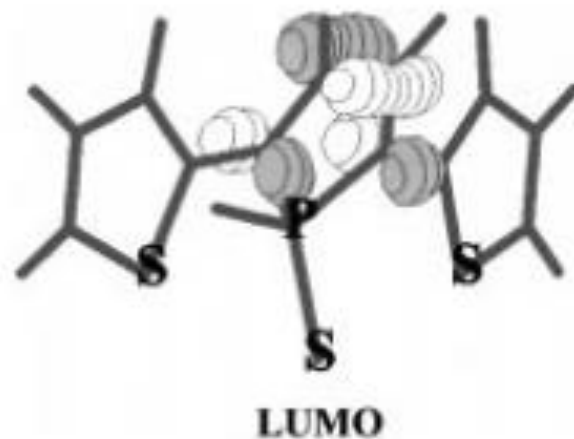
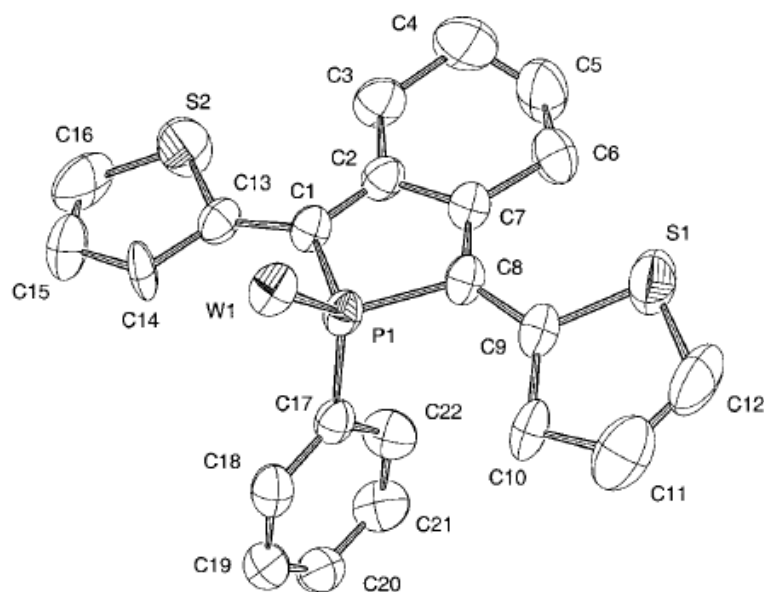
15 Joint research papers

- 1 Bertrand, G.; Einfeld, W.; Nyulászi, L.; Reau, R.; Regitz, M.; Szieberth, D. Diphosphetes - Substituent Stabilized Ring Systems. *J. Chem. Soc. Perkin 2.* **2000**(11) 2324 - 2327.
- 2 C. Hay, M. Hissler, C. Fischmeister, J. Rault-Berthelot, L. Toupet, L. Nyulászi, R. Reau. Phosphole-Containing p-Conjugated Systems: From Model Molecules to Polymer Films on Electrodes *Chem. Eur. J.* **2001**, *7*, 4222-4236.
- 3 C. Fave, M. Hissler, T. Kárpáti, J. Rault-Berthelot, V. Deborde, L. Toupet, L. Nyulászi, R. Réau Connecting p-Chromophores by s-P-P bond: New Type of Assemblies Exhibiting s-p Conjugation *J. Am. Chem. Soc.* **2004**, *126*(19), 6058-6063.
- 4 L. Nyulászi, O. Hollóczki, C. Lescop, M. Hissler, R. Réau, Aromatic-antiaromatic switch in P-heteroles. *Organic and Biomolecular Chemistry* **2006**, *4*, 996-998.
- 5 V. L. de Talancé, M. Hissler, L-Z. Zhang, T. Kárpáti, L. Nyulászi, P. Bauerle, R. Réau, Synthesis, Electronic Properties and Electropolymerisation of EDOT-capped σ^3 -Phospholes. *Chem. Comm.* **2008**, 2200-2202.
- 6 O. Fadhel, D. Szieberth, V. Deborde, C. Lescop, L. Nyulászi, M. Hissler, R. Réau, Synthesis, Electronic Properties and Reactivity of Phospholes and 1,1'-Biphospholes Bearing 2- or 3-thienyl C-Substituents. *Chem. Eur. J.* **2009**, *15*, 4914-4929.
- 7 O. Fadhel, Z. Benkő, M. Gras, V. Deborde, D. Joly, C. Lescop, L. Nyulászi, M. Hissler, R. Réau 3,4-Dithia-Phosphole and -1,1'-Biphosphole π -conjugated systems: S makes the Impact. *Chem. Eur. J.* **2010**, *16*, 11340-11356.
- 8 P.-A. Bouit, A. Escande, R. Szűcs, D. Szieberth, C. Lescop, L. Nyulászi, M. Hissler, R. Réau Dibenzophosphapentaphenes: Exploiting P Chemistry for Gap Fine-Tuning and Coordination-Driven Assembly of Planar Polycyclic Aromatic Hydrocarbons *J. Am. Chem. Soc.* **2012**, *134*, 6524-6527.
- 9 F. Riobé, R. Szűcs, P.-A. Bouit, D. Tondelier, B. Geffroy, F. Aparicio, J. Buendía, L. Sánchez, R. Réau, L. Nyulászi, M. Hissler Synthesis, electronic properties and WOLED devices of planar phosphorus-containing polycyclic aromatic hydrocarbons *Chem. Eur. J.* **2015**, *21*, 6547-6556.

- 10 J. A. W. Sklorz, S. Hoof, N. Rades, N. De Rycke, L. Könczöl, D. Szieberth, M. Weber, J. Wiecko, L. Nyulászi, M. Hissler, C. Müller, Pyridyl-Functionalized 3*H*-1,2,3,4-Triazaphospholes: Synthesis, Coordination Chemistry and Photophysical Properties of Novel Low-Coordinate Phosphorus Compounds. *Chem. Eur. J.* **2015**, *21*, 11096-11109. DOI: 10.1002/chem.201500988
- 11 R. Szűcs, P.-A. Bouit, M. Hissler, L. Nyulászi, Edge Modification of PAHs. The effect of embedded heterocycles on the aromaticity pattern. *Struct. Chem.* **2015**, *26*(5-6), 1352-57..
- 12 W. Delaunay, R. Szűcs, S. Pascal, A. Mocanu, P.-A. Bouit, L. Nyulászi, M. Hissler Synthesis and electronic properties of Polycyclic Aromatic Hydrocarbons doped with Phosphorus and Sulfur *Dalton Transactions* **2016**, *45*, 1896–1903. DOI: 10.1039/c5dt04154f Inside cover
- 13 R. Szűcs, F. Riobé, A. Escande, D. Joly, P.-A. Bouit, L. Nyulászi, M. Hissler, Synthetic way toward P-containing PAHs and effect of P-substitution on the electronic properties. *Pure and Appl. Chem.* **2017**, *89*, 341-355.
- 14 F. Riobé, R. Szűcs, C. Lescop, R. Réau, L. Nyulászi, P.-A. Bouit, M. Hissler *Organometallics* **2017**, *36*, 2502-2511. DOI: 10.1021/acs.organomet.6b00715 in press
- 15 R. Szucs, P.-A. Bouit, L. Nyulaszi, M. Hissler, Phosphorus-Containing Polycyclic Aromatic Hydrocarbons. *ChemPhysChem.* **2017**, *18*, 2618-2630.
- 16 A. Mocanu, R. Szűcs, E. Caytan, T. Roisnel, V. Dorcet, P.-A. Bouit, L. Nyulászi, M. Hissler submitted

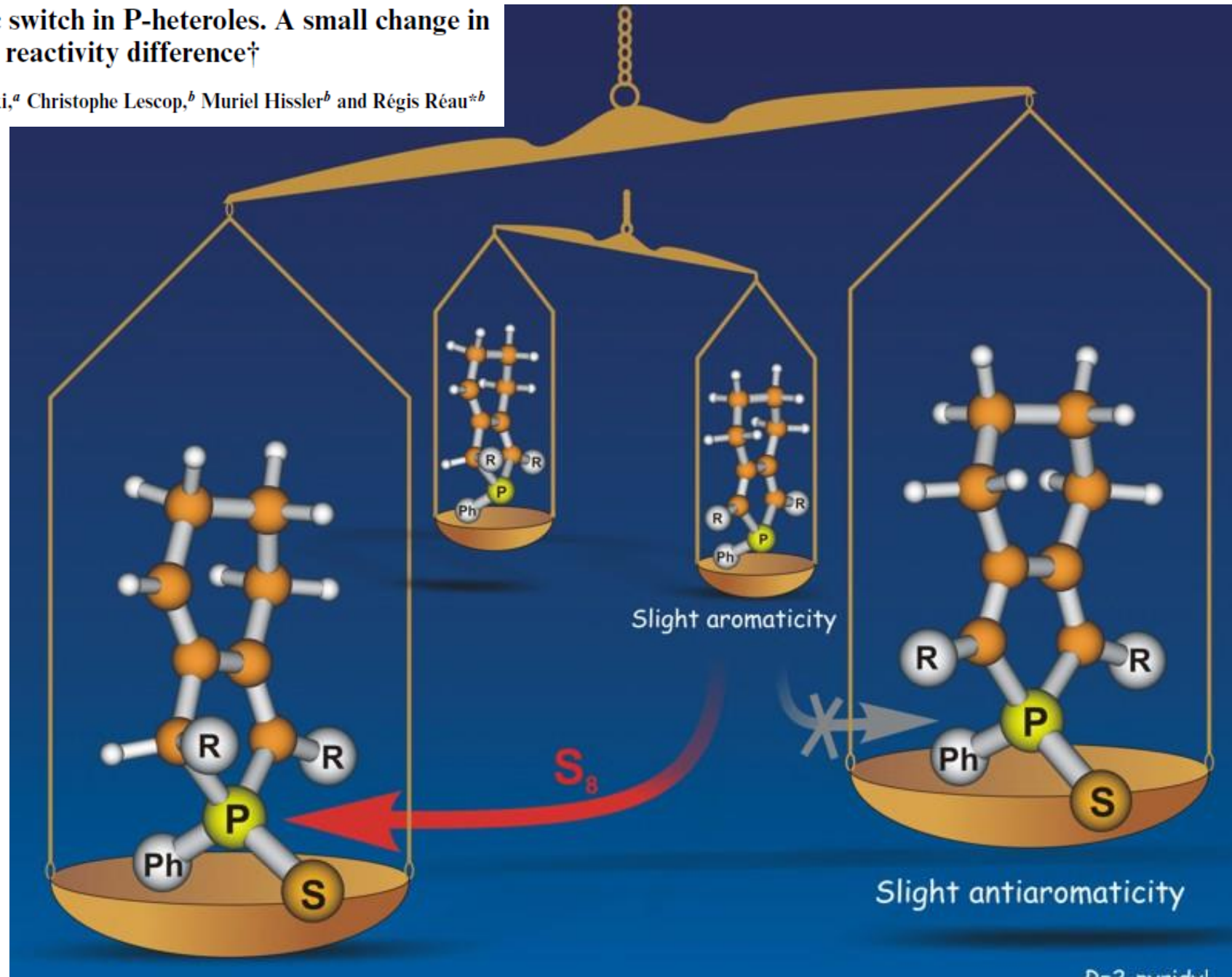
Phosphole-Containing π -Conjugated Systems: From Model Molecules to Polymer Films on Electrodes

Caroline Hay,^[a] Muriel Hissler,^[a] Cédric Fischmeister,^[a] Joëlle Rault-Berthelot,^[b]
Loïc Toupet,^[c] László Nyulászi,^{*[d]} and Régis Réau^{*[a]}



An aromatic–antiaromatic switch in P-heteroles. A small change in delocalisation makes a big reactivity difference†

László Nyulászi,^{*a} Oldamur Hollóczki,^a Christophe Lescop,^b Muriel Hissler^b and Régis Réau^{*b}

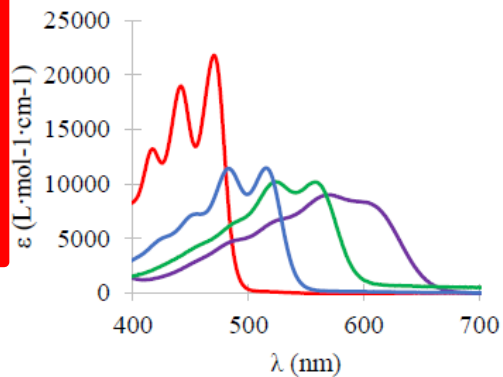
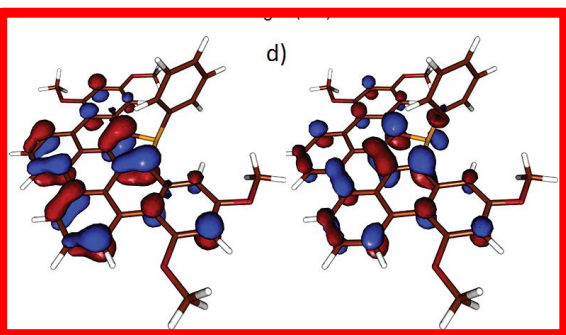
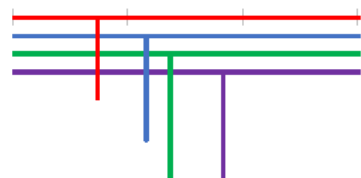
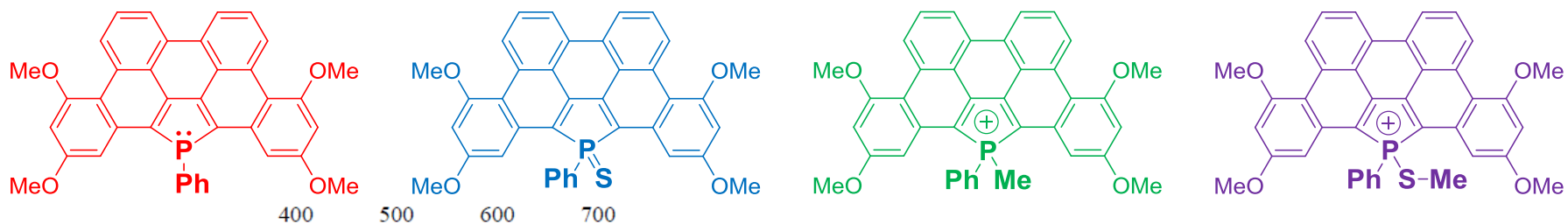


P

Energy Conversion

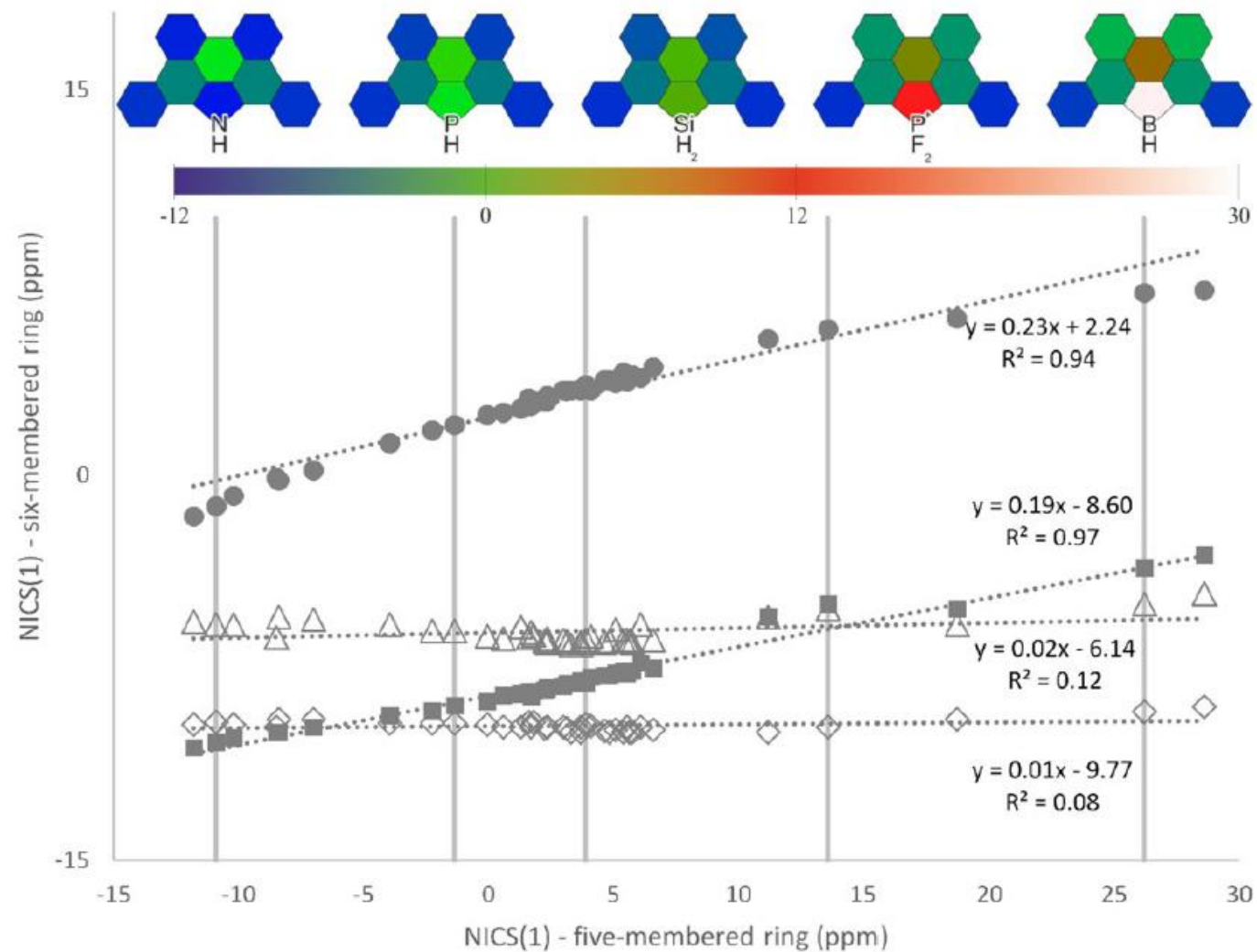
Synthesis, Electronic Properties and WOLED Devices of Planar Phosphorus-Containing Polycyclic Aromatic Hydrocarbons**

François Riobé,^[a] Rózsa Szűcs,^[a, b] Pierre-Antoine Bouit,^[a] Denis Tondelier,^[c] Bernard Geffroy,^[d] Fátima Aparicio,^[e] Julia Buendía,^[e] Luis Sánchez,^[e] Régis Réau,^[a] László Nyulászi,^{*,[b]} and Muriel Hissler^{*,[a]}



Phosphorus-Containing Polycyclic Aromatic Hydrocarbons

Rózsa Szűcs,^[a, b] Pierre-Antoine Bouit,^{*[a]} László Nyulászi,^{*[b]} and Muriel Hissler^{*[a]}





PHOSPHORUS MODIFIED PAHs
Tunable π -systems for optoelectronic applications

PhD thesis

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Institut des Sciences Chimiques de Rennes,
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2017



