

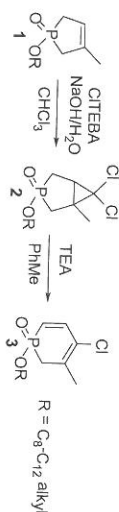
THE SYNTHESIS AND USE OF 1-ALKOXY- AND 1-AMINO-3-PHOSPHOLENE 1-OXIDES

Nóra Zs. Kiss, Róbert Örkényi, Zita Rádai, György Keglevich

Department of Organic Chemistry and Technology, Budapest University of Technology and Economics, Budapest, H-1521, Hungary
zskiss@mail.bme.hu

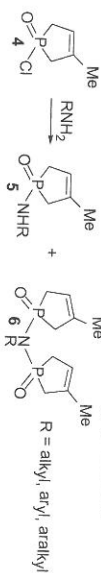
Various 3-phospholene 1-oxides, such as 1-alkoxy and 1-amino derivatives that are available by the McCormack reaction and subsequent direct functionalizations, form a representative group of *P*-heterocycles.^{1,2}

1-Alkoxy-3-phospholene 1-oxides (1), obtained directly from the corresponding phosphinic acids by MW-assisted direct esterification, can be used in ring enlargement involving the addition of dichlorocarbene on the double-bond of the phospholene oxide (1) followed by the thermal opening of the cyclopropane ring of the dichlorocarbene adduct (2) so formed.



We have found that higher carbon atom chain alkoxy groups promote the dichlorocarbene addition reaction.

The synthesis of 1-amino-3-phospholene 1-oxides (5) involves the reaction of the corresponding phosphinic chloride (4) with amines. However, the reaction results in a mixture containing the expected amino-phospholene oxide (5) and, surprisingly, its *N*-phosphinoyl derivative (6) as a by-product.



It was found, that the product composition could be influenced (fine-tuned) and thus, either phosphinic amide 5 or the corresponding bis product (6) can be obtained selectively, and in high yields.

References:

1. Keglevich, G.; Grün, A.; Bálint, E.; Kiss, N. Zs.; Jablonkai, E. *Curr. Org. Chem.* **2013** (in press).
2. Keglevich, G.; Kiss, N. Zs.; Körtvélyesi, T.; *Heteroatom Chem.* **2013** (in press).
3. Kiss, N. Zs.; Simon, A.; Drahos, L.; Huben, K.; Jankowski, S.; Keglevich, G. *Synthesis*, **2013**, 45, 199.

92

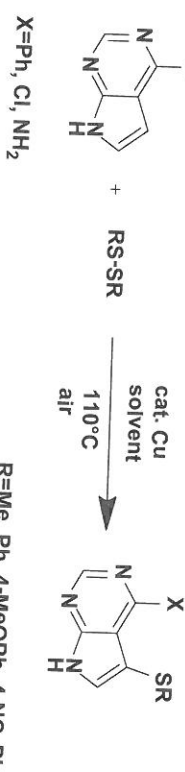
DIRECT C-H SULFENYLATION OF 7-DEAZAPURINES

Martín Klečka,^{a,b} Michal Hocek^{a,b*}

^a Dept. of Organic Chemistry, Faculty of Science, Charles University in Prague, Hlavova 8, CZ-12843 Prague 2, Czech Republic

^b Institute of Organic Chemistry and Biochemistry, v.v.i., Academy of Sciences of the Czech Republic; Gilead Sciences & IOCB Research Center, Prague, Czech Republic;
klecka@uochb.cas.cz, hocek@uochb.cas.cz

Purines¹ and their analogues show a great variety of biological activities. 7-Deazapurines (pyrrolo[2,3-*d*]pyrimidines) have been much less thoroughly studied but some examples display antibiotic², antiviral³ and cytostatic⁴ effects. In our previous study, we have reported synthetic approach to 8-modified 7-deazapurines via a “one pot” C-H borylation followed by Suzuki coupling.⁵ An analogy to C-H sulfenylation of indoles,⁶ we report here on sulfenylation of 7-deazapurines to position 7 by diverse disulfides using Cu catalysis in air. Optimized conditions (Scheme 1) allowed the synthesis of the target 7-alkyl- or -arylsulfonyl derivatives in nearly quantitative yields.



Scheme 1

Acknowledgement:

This work is part of a research project by Czech Science Foundation (P207/12/0205) and by Gilead Sciences, Inc. (Foster City, CA, U.S.A.).

References:

- 1) Review: Legraverend, M.; Grierson, D.S. *Bioorg. Med. Chem.* **2006**, 14, 3987-4006
- 2) Anzai, K. *J. Antibiotics* **1957**, 10, 201-204
- 3) Wu, R.; Smidansky, E.D.; Oh, H.S.; Takthampunya, R.; Padmanabhan, R.; Cameron, C.E.; Peterson, B.R. *J. Med. Chem.* **2010**, 53, 7958-7966
- 4) Nauš, P.; Pohl, R.; Votruba, I.; Džubák, P.; Hajdúch, M.; Ameral, R.; Bitkus, G.; Wang, T.; Ray, A.S.; Mackman, R.; Chlár, T.; Hocek, M. *J. Med. Chem.* **2010**, 53, 460-470
- 5) b) Spáčilová, P.; Nauš, P.; Pohl, R.; Votruba, I.; Širáňel, J.; Zábranská, H.; Pichová, I.; Ameral, R.; Bitkus, G.; Čilič, T.; Hocek, M. *ChemMedChem* **2010**, 5, 1386-1396
- 6) Klečka, M.; Pohl, R.; Klepetářová, B.; Hocek, M. *Org. Biomol. Chem.* **2009**, 7, 866-868
- a) Li, Z.; Hong, J.; Zhou, X. *Tetrahedron* **2011**, 67, 3690-3697
- b) La Regina, G.; Gatti, V.; Famiglini, V.; Piscitelli, F.; Silvestri, R. *ACS Comb. Sci.* **2012**, 14, 258-262

93