A Journal of the Gesellschaft Deutscher Chemiker

Angewandte International Edition GDCh Chemie

www.angewandte.org

Accepted Article

Title: Selective ortho C-H Cyanoalkylation of (Diacetoxyiodo)arenes via [3,3]-Sigmatropic Rearrangement

Authors: Junsong Tian, Fan Luo, Chaoshen Zhang, Xin Huang, Yage Zhang, Lei Zhang, Lichun Kong, Xiaochun Hu, Zhi-Xiang Wang, and Bo Peng

To be cited as: *Angew. Chem. Int. Ed.* 10.1002/anie.201803455
Angew. Chem. 10.1002/ange.201803455

Link to VoR: http://dx.doi.org/10.1002/anie.201803455
http://dx.doi.org/10.1002/ange.201803455

WILEY-VCH

10.1002/anie.201803455

WILEY-VCH

Selective *ortho* C-H Cyanoalkylation of (Diacetoxyiodo)arenes via [3,3]-Sigmatropic Rearrangement

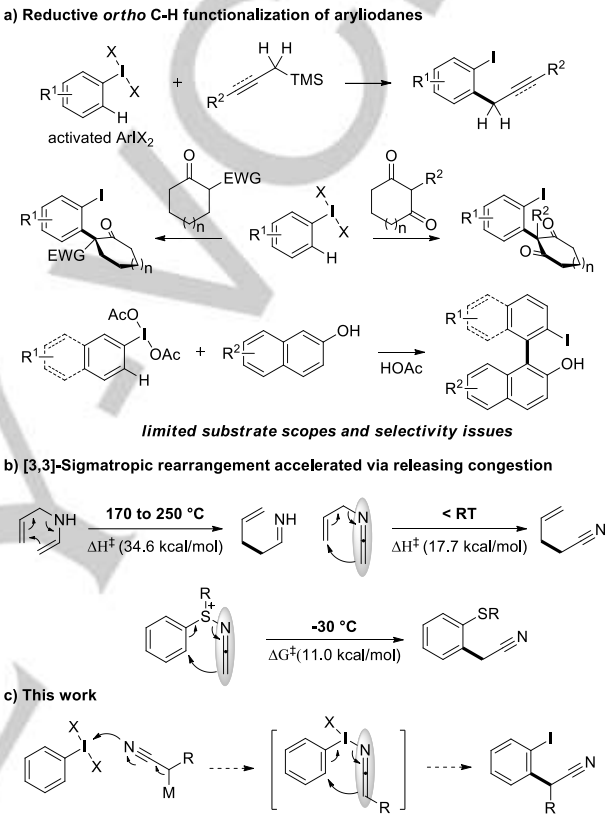
Junsong Tian, Fan Luo[+], Chaoshen Zhang[+], Xin Huang,* Yage Zhang, Lei Zhang, Lichun Kong, Xiaochun Hu, Zhi-Xiang Wang,* Bo Peng*

Dedicated to Professor Benjamin List on the occasion of his 50th birthday

Abstract: We herein report a robust catalyst-free cross-coupling between $ArI(OAc)_2$ and α-stannyl nitriles, aided by TMSOTf. The transformation introduces a cyanoalkyl group to the *ortho* position of $ArI(OAc)_2$ and simultaneously reduces the aryl iodine(III) to iodide, thus providing α-(2-iodoaryl) nitrile as the product. This transformation could be completed within 5 min at -78 °C and features superb functional group tolerance and efficient scalability. DFT calculations indicate that the formation of a ketenimine(aryl)iodonium intermediate and subsequent [3,3]-sigmatropic rearrangement are involved as key steps.

Aryl iodine(III) reagents are widely used as unique oxidants, aryl sources and catalysts in organic synthesis.[1] The iodide atom of aryliodanes is often discarded after reactions. An exceptional example to have the iodide group retained was presented by Oh and coworkers in their 1988 work of reductive *ortho* allylation of iodosylbenzene with allylsilane (Scheme 1a).[2] Although the yield of the example was not high (36%), this unusual cross-coupling initiated an attractive synthetic protocol to exploit aryl iodine(III) reagents, because maintaining a transformable iodide group facilitates the further derivatization of the product. Recently, Zhu et al extended the scope of this chemistry to certain aryliodanes bearing strong electron-donating groups at the *meta*-position.[3] Compared with allylsilanes, Ochiai et al. found propargylsilanes to be more effective for the reaction, although only a few primary propargylsilanes and substituted aryliodanes were presented.[4] Most recently, Shafir and Vallribera elegantly extended the reaction scope to carbonyl compounds (Scheme 1a).[5] Remarkably, their protocol enabled the construction of challenging quaternary carbon centers on benzene rings *ortho* to the iodide, although the scope of nucleophiles is limited to structurally well-defined β-dicarbonyl compounds. When we prepared the paper, Yorimitsu et al reported an impressive synthesis of biaryls using 2-naphthols as coupling partners (Scheme 1a).[6] Despite of all the progresses made, the limited substrate scopes and low yields associated with these procedures call for further development of the protocol.

The Claisen rearrangement of N-allyl-ketenimine proceeds under much milder conditions than that of N-allyl-vinylamine (Scheme 1b), which was systematically studied by Walters and others between 1991 and 1996.[7] The much easier rearrangement of the former than the later was attributed to the release of the steric congestion associated with the ketenimine group.[7a] However, in comparison with the well-established charge-accelerated [3,3]-sigmatropic rearrangement[8], the accelerated rearrangement via congestion release has not caught much attention, which is probably due to the difficulty in accessing the ketenimine-rearrangement precursor (Scheme 1b). Nevertheless, we have recently found that a ketenimine(aryl)sulfonium intermediate could be assembled by treating activated arylsulfoxides with alkylnitriles and bases. In line with Walters' observation, this intermediate readily undergoes [3,3]-sigamtropic rearrangement at low temperature (-30 °C) crossing a relative low energy barrier (11.0 kcal mol^{-1}) (Scheme 1b).[9] Therefore, we envisaged that the acceleration effect could be used to carry out reductive *ortho* C-H cyanoalkylation of aryliodanes. As illustrated in Scheme 1c, we hypothesized that trapping electrophilic $PhIX_2$ species with



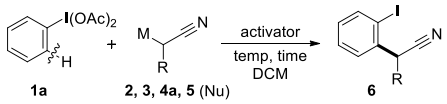
Scheme 1. Background and hypothesis

[*] J. Tian, F. Luo, X. Huang, Y. Zhang, L. Zhang, L. Kong, X. Hu, Prof. Dr. B. Peng*
Key Laboratory of the Ministry of Education for Advanced Catalysis Materials, Zhejiang Normal University
Jinhua 321004, China
E-mail: pengbo@zjnu.cn
C. Zhang, Prof. Z. Wang
School of Chemistry and Chemical Engineering, University of the Chinese Academy of Sciences
Beijing 100049, China
E-mail: zxwang@ucas.ac.cn
[+] These authors contributed equally to this work

10.1002/anie.201803455

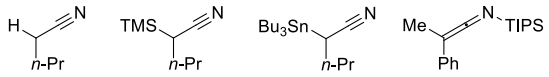
WILEY-VCH

Table 1. Hypothesis verification and optimization of reaction conditions[a]



1a **2, 3, 4a, 5** (Nu) **6**

entry	Nu	activator	temp	time	yield[b] of **6**
1	**2**	TMSOTf	-78 °C to rt	12 h	0
2	**3**	TMSOTf	-78 °C to rt	12 h	11
3	**4a**	TMSOTf	-78 °C to rt	12 h	63[c]
4	**5**	TMSOTf	-78 °C to rt	12 h	0[d]
5	**4a**	none	-78 °C to rt	12 h	0[c]
6	**4a**	$BF_3{\cdot}Et_2O$	-78 °C to rt	12 h	46
7	**4a**	Tf_2O	-78 °C to rt	12 h	45
8	**4a**	TMSOTf	-78 °C	12 h	65
9	**4a**	TMSOTf	-100 °C	12 h	68
10	**4a**	TMSOTf	-50 °C	12 h	35[d]
11	**4a**	**TMSOTf**	**-78 °C**	**5 min**	**77[e]**
12	**4a**	TMSOTf	-78 °C	10 s	76[e]

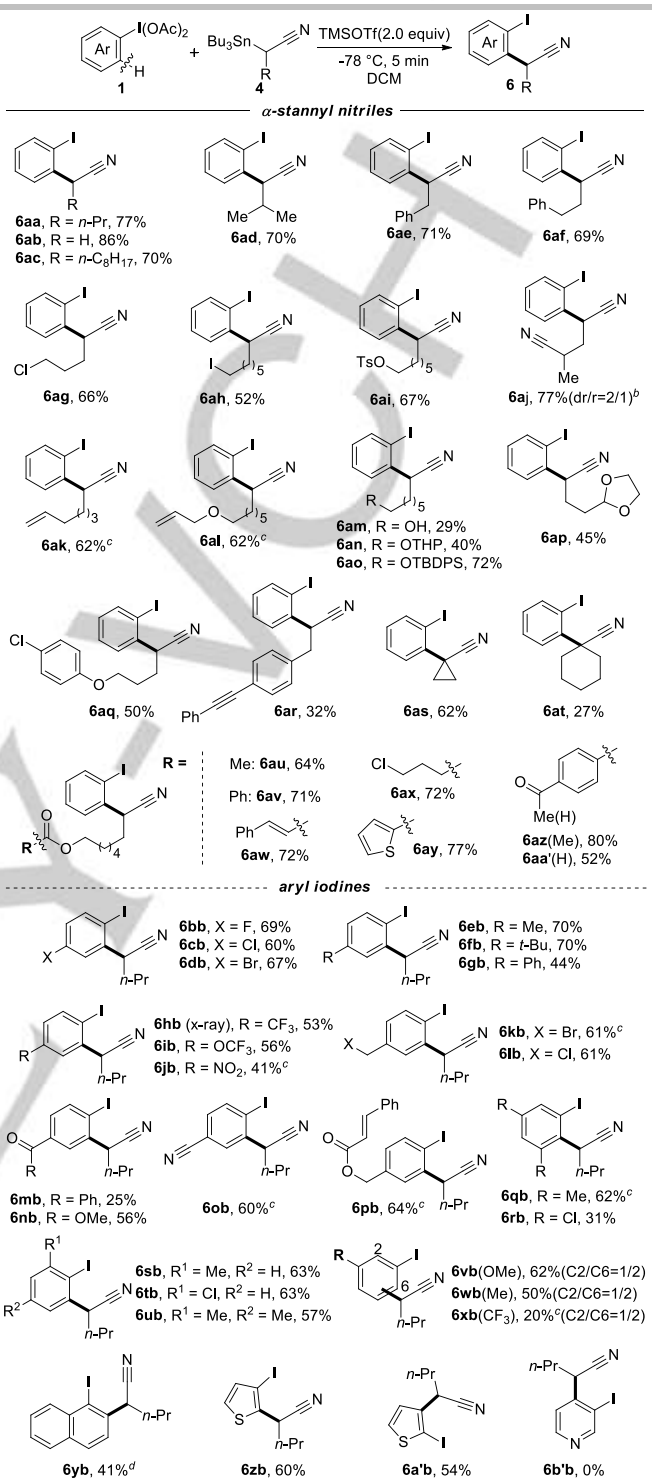


2 **3a** **4a** **5**

[a] Unless otherwise noted, the reaction was performed by the addition of Nu (1.0 equiv) to a mixture of **1a** (0.3 mmol) and activator (2.0 equiv) in DCM (3 mL). [b] Isolated yield. [c] 63% of **3** or 41% of **4a** was recovered. [d] **4a** or 5 deteriorated during the reaction. [e] 1.2 equiv of **4a** was used. For further examinations of alkylnitrile **2** and α-silyl nitrile **3**, see the supporting information.

suitable nitrile nucleophiles could result in a ketenimine(aryl)iodonium intermediate, which can undergo congestion-released rearrangement with to afford the desired α-(2-iodoaryl) nitrile.

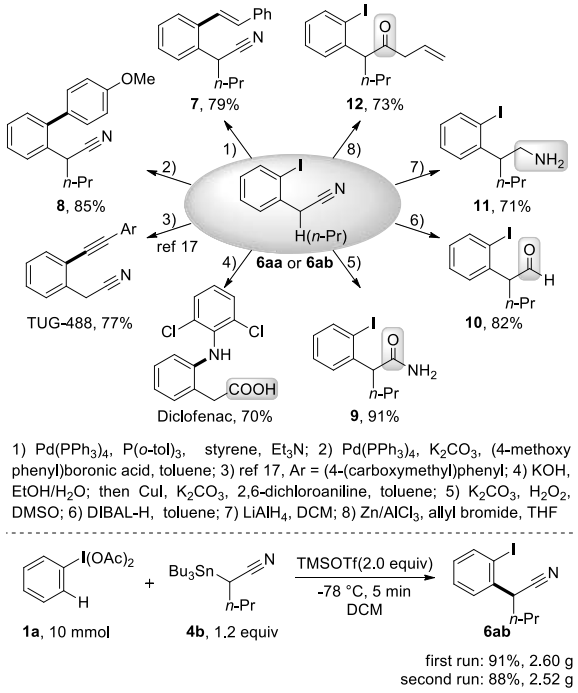
To verify our hypothesis, we commenced the study by treating $PhI(OTf)_2$ (formed in situ by the addition of TMSOTf to $PhI(OAc)_2$)[10] with several nitrile nucleophiles (Table 1). Simple nitrile **2** did not provide any desired product when treated with $PhI(OTf)_2$ (entry 1). To promote the deprotonation of **2**, organic bases such as DABCO, *i*-Pr_2EtN and pyridines were introduced in the reaction (for details, see SI).[9] In spite of these efforts, the desired product could not be determined consistently. To our delight, α-silyl nitrile **3a** afforded the desired product **6aa** in 11% yield under the indicated conditions (entry 2). However, the yield could not be further improved through routine optimization. To facilitate the delivery of nitrile moiety from α-silyl nitrile, we employed "F" anion sources (CsF, TBAF, TBAT) and examined other α-silyl nitriles (α-TIPS nitrile **3b**, α-TBS nitrile **3c**, α-(dimethylsilyl) nitrile **3d**) (for details, see SI). Unfortunately, all these efforts failed to improve the yield. We ascribed the unsatisfying results to the weak nucleophilicity of nitriles **2** and **3**, which could not effectively generate the ketenimine(aryl)iodonium intermediate (Scheme 1c). Thus, we switched to more nucleophilic α-stannyl nitrile **4a**.[11,12] Excitingly, the yield of the reaction was increased significantly and **6aa** was obtained in 63% yield (entry 3). Silyl ketenimine **5** proved unsuitable for the reaction, which could be due to its improper



Scheme 2. Reaction scope. [a] Unless otherwise noted, reactions were performed with **1** (0.5 mmol) under optimized conditions. [b] **4j** was prepared from corresponding alkylnitrile (1.5 mmol) and used without purification. [c] 1.8 equiv of **4** was used. [d] $BF_3{\cdot}Et_2O$ was used instead of TMSOTf.

nucleophilic site of terminal carbon (entry 4). The choice of the activator was found essential for the reaction (entries 5-7). Without activators, $PhI(OAc)_2$ exhibited no reactivity toward **4a** (entry 5). $BF_3{\cdot}Et_2O$ and Tf_2O were also effective activators for the reaction although giving lower yields than that of TMSOTf (entries 6 and 7). Without gradually raising the temperature, the reaction could still proceed smoothly at -78 °C with a good yield (65%) (entry 8). It is worthy of noting that lowering the

10.1002/anie.201803455



Scheme 3. Elaboration of products and gram-scale reactions.

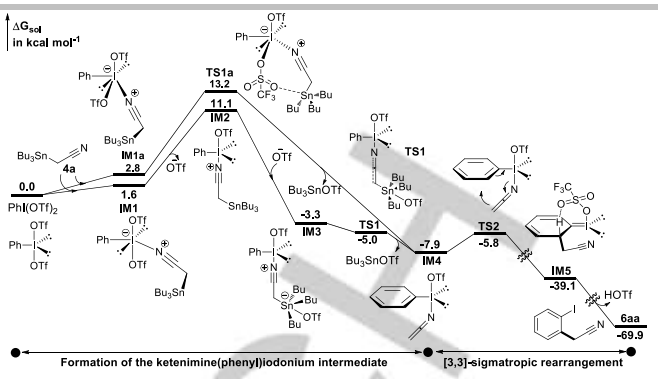


Figure 1. Free energy profile for the reaction of $PhI(OTf)_2$ with **4a**. Complete free energy profile with high-lying intermediates and transition states are given in SI6.2.

temperature to -100 °C did not slow down the reaction (entry 9) but raising the temperature to -50 °C dramatically decreased the yield (entry 10). Strikingly, when increasing the amount of **4a** to 1.2 equiv, the reaction could be completed within 5 min (entry 11) or even shorter time (10 s, entry 12) with good yields (77% and 76%, respectively). To the best of our knowledge, there have been no examples of aromatic cyanoalkylations which could finish within such short time at such low temperature. Considering the experimental convenience, we conducted all reactions below at -78 °C for 5 min. More details for optimization are given in SI3.

With the optimum conditions in hand, we first examined the reaction scope using various α-stannyl nitriles (Scheme 2). It was found that electron-deficient functional groups such as alkyl/aryl halides (**6ag**, **6ah**, **6aq** and **6ax**), a sulfonate (**6ai**), a nitrile (**6aj**), an electron-poor alkene (**6aw**), esters (**6au**-**6az'**), a ketone (**6az**) and an aldehyde (**6az'**) are all well tolerated, as these functional groups could be a challenge for conventional aromatic cyanoal-kylation.[13-15] Furthermore, these preserved functionalities provide a platform for further functionalization of the products. Remarkably, electron-rich functionalities such as alkenes (**6ak** and **6al**), alkyl/phenol ethers (**6al**, **6ao** and **6aq**), an acetal (**6ap**), and benzene/thiophene rings (**6ae**, **6af** and **6ay**), which can be readily oxidized by aryl iodine(III) reagents,[1] are also well-tolerated under the reaction conditions. We tentatively attribute the excellent chemoselectivity to the selective recognition of the highly electrophilic aryl iodine(III) species by α-stannyl nitriles. Unexpectedly, a primary alcohol **6am** was also partially tolerated and **6am** was obtained in a low but reasonable yield (29%). Pleasingly, when alcohol **4m** protected by TBDPS group, the reaction of **4ao** afforded corresponding **6ao** in good yield (72%). It is not a surprise that an internal alkyne group had a deleterious effect on the reaction of **4r**, which furnished **6ar** in a low yield (32%). Notably sterically hindered cyclopropyl nitrile **4s** smoothly afforded **6as** in a synthetically useful yield (62%) by constructing a quaternary carbon. However, **4t**, which was also sterically hindered, furnished quaternary nitrile **6at** in poor yield (27%).

Next, a variety of (diacetoxyiodo)arenes **1b**-**1y** were examined under the optimum conditions (Scheme 2). Remarkable functional group compatibility was observed in the use of functionalized aryliodane substrates. Aryl/alkyl halides (**6bb**-**6db**, **6kb** and **6lb**), a ketone (**6mb**), esters (**6nb** and **6pb**), a nitrile (**6nb**), and an alkene (**6pb**) were well-tolerated in the reaction. Notably benzylic halides (**4k** and **4l**), which are typically recognized as good electrophiles, were also adopted by the reaction, as these functional groups are often problematic for conventional C-C bond formation reactions. Interestingly *meta*-substituted phenyl iodanes (**4v**-**4x**) furnished expected products (**6vb**-**6xb**) with a similar regio-selectivity (C2/C6=1/2). Naphthalene **4y** decomposed under the optimum conditions. However, replacing TMSOTf with less electrophilic $BF_3{\cdot}Et_2O$ gave rise to **6yb** albeit in a low yield (41%). To our delight, heteroarenes, thiophenes **4z** and **4a'** also underwent the transformation to produce **6xb** and **6yb**, respectively, in synthetically useful yields. However, pyridine **4b'** proved unfeasible for the reaction which is probably due to the inhibition of iodine(III) specie by nucleophilic pyridine nitrogen.

To demonstrate the synthetic utility of this reaction, products **6aa** and **6ab** were further elaborated as shown in Scheme 3. The iodide group could be easily converted to vinyl, phenyl, and nitrogen groups through transition-metal catalyzed cross-coupling reactions.[16] Ulven et al demonstrated that product **6ab** can be readily coupled with a terminal alkyne to produce a drug candidate, TUG-488[17]. Through sequential hydrolysis of the nitrile moiety and copper-catalyzed C-N bond formation, product **6ab** was conveniently converted to an anti-inflammatory drug, Diclofenac, in 70% yield over two steps.[18] In addition to iodide elaboration, the nitrile group of **6aa** was also hydrolyzed or reduced to primary amide **9**, aldehyde **10**, primary amine **11** and ketone **12** in good yields (71-91%). Furthermore, a gram-scale reaction using10 mmol of $PhI(OAc)_2$ as the starting material was performed twice under the optimum conditions (Scheme 3). Surprisingly, both gram-scale reactions provided better chemical yields (91% and 88%) than the original model reaction (77%). This beneficial effect of a large-scale condition strongly demonstrates the practicality of the technology.

To shed light on the reaction mechanism, we performed DFT computations (see SI6 for computational details) to characterize the pathways for the reaction of $PhI(OTf)_2$ with α-stannyl nitrile **4a**, considering that $PhI(OTf)_2$ can be formed upon mixing

$PhI(OAc)_2$ with TMSOTf (2.0 equiv) as demonstrated by Wirth's NMR studies[10b]. Consistently, the conversion ($PhI(OAC)_2$ + 2*TMSOTf → $PhI(OTf)_2$ + 2*TMSOAc) was predicted thermodynamically favorable by 4.9 kcal mol^{-1}. As illustrated in Figure 1, the reaction proceeds via substitution of a OTf group of $PhI(OTf)_2$ by the nitrile group of **4a**, generating a ketenimine(phenyl)iodonium triflate **IM4**, followed by [3,3]-sigmatropic rearrangement, eventually leading to the product **6aa**. Along the black pathway, the substitution takes place via nucleophilic attack of **4a**, first forming **IM1**, then **IM2** after OTf^- dissociation from **IM1**. Subsequently, the dissociated triflate anion attacks **IM2** at the Sn center through a SN2 process. In terms of electronic energy, the SN2 intermediate (**IM3**) and transition state (**TS1**) could be located, but **TS1** is lower than **IM3** in terms of free energy, thus **IM4** could actually be formed straightforwardly. Alternatively, the blue pathway proceeds through a concerted mechanism to form **IM4**, as illustrated by **TS1a**. Comparing the two pathways, the black pathway is 2.1 kcal mol^{-1} more favorable than the blue one. However, considering the overestimation of the entropy penalty for the concerted process, we speculated the two mechanisms to form **IM4** are competitive (see SI6.1). The [3,3] sigmatropic rearrangement can readily take place via crossing a low barrier of 2.1 kcal mol^{-1} (**TS2**), leading to **IM5**. In **IM5**, the OTf^- is close to the *ortho* C-H group, which facilitates the group to extract the hydrogen for rearomatization, giving the final product **6aa**. Overall, because of the congestion release, the [3,3] sigmatropic rearrangement is easy to take place. Thus, the formation of **IM4** via **IM2** or **TS1a** becomes a rate-determining event of the reaction and the whole reaction is highly exergonic by 69.9 kcal mol^{-1}, indicating that the reaction can indeed take place facilely. The released HOTf acid from **IM5** could further react with TMSOAc, giving less acidic HOAc, since the conversion (HOTf + TMSOAc → TMSOTf + HOAc) is exergonic by 6.7 kcal mol^{-1}. Note that, in addition to the favorable pathways discussed above, we considered other possible mechanisms with results included in SI6.2.

In summary, we have described a catalyst-free cross-coupling between (diacetoxyiodo)arenes with α-stannyl nitriles. Compared with conventional aromatic cyanoalkylations,[13-15] the reaction maintains a transformable iodide group in the product, which allows the synthesis of unique α-(2-iodoaryl) nitriles. The robustness of the reaction (-78 °C for 5 min) gives this process exquisite selectivity, excellent functional group compatibility and broad substrate scope. Efficient scale-up reactions demonstrate the practicality of the method. DFT mechanistic study unveiled that the transformation proceeds via forming a ketenimine(phenyl)iodonium intermediate, followed by a facile [3,3]-sigmatropic rearrangement. Further mechanistic studies and applications of the reaction are ongoing in our laboratory.

Acknowledgements ((optional))

This work is supported by NSFC-21502171 and Zhejiang Normal University. Z.X. W. acknowledges the support of NSFC-21573233.

Keywords: hypervalent iodine • sigmatropic rearrangement • cyanoalkylation • electrophilic activationn • organotin

[1] a) T. Wirth, *Topics in Current Chemistry: Hypervalent Iodine Chemistry*, Springer International Publishing: Switzerland, **2016**; b) V. V. Zhdankin, *Hypervalent Iodine Chemistry: Preparation, and Structure Synthetic Application of Polyvalent Iodine Compounds*, John Wiley & Sons Ltd.: New York, **2014**; c) A. Yoshimura, V. V. Zhdankin, *Chem. Rev.* **2016**, *116*, 33285; d) V. V. Zhdankin, P. J. Stang, *Chem. Rev.* **2008**, *108*, 5299.

[2] a) K. Lee, D. Y. Kim, D. Y. Oh, *Tetrahedron Lett.* **1988**, *29*, 667; b) For a recent review: A. Shafir, *Tetrahedron Lett.* **2016**, *57*, 2673.

[3] a) H. R. Khatri, H. Nguyen, J. K. Dunaway, J. Zhu, *Front. Chem. Sci. Eng.* **2015**, *9*, 359; b) H. Nguyen, H. R. Khatri, J. Zhu, *Tetrahedron Lett.* **2013**, *54*, 5464; c) H. R. Khatri, J. Zhu, *Chem. Eur. J.* **2012**, *18*, 12232.

[4] a) M. Ochiai, M. Kida, T. Okuyama, *Tetrahedron Lett.* **1998**, *39*, 6207; b) M. Ochiai, T. Ito, *J. Org. Chem.* **1995**, *60*, 2274; c) M. Ochiai, T. Ito, Y. Masaki, *J. Chem. Soc.,Chem. Commun.* **1992**, *1*, 15; d) M. Ochiai, T. Ito, Y. Takaoka, Y. Masaki, *J. Am. Chem. Soc.* **1991**, *113*, 1319; (e) D. A. Gately, T. A. Luther, J. R. Norton, M. M. Miller,; O. P. Anderson, *J. Org. Chem.* **1992**, *57*, 6496.

[5] a) Z. Jia,. E. Gálvez, R. M. Sebastián, R. Pleixats, A. Álvarez-Larena, E. Martin, A. Vallribera, A. Shafir, *Angew. Chem. Int. Ed.* **2014**, *53*, 11298; b) Y. Wu, I. Arenas, L. M. Broomfield, E. Martin,; A. Shafir, *Chem. Eur. J.* **2015**, *21*, 18779; c) Y. Wu, S. Izquierdo, P. Vidossich, A. Lledós, A. Shafir, *Angew. Chem. Int. Ed.* **2016**, *55*, 7152.

[6] M. Hori, J.-D. Guo, T. Yanagi, K. Nogi, T. Sasamori, H. Yorimitsu, *Angew. Chem. Int. Ed.* **2018**, DOI: 10.1002/anie.201801132.

[7] a) M. A. Walters, *J. Org. Chem.* **1996**, *61*, 978; b) M. A. Walters, A. B. Hoem, C. S. McDonough, *J. Org. Chem.* **1996**, *61*, 55; c) M. A. Walters, *J. Am. Chem. Soc.* **1994**, *116*, 11618; d) R. Bruckner, R. Huisgen, *Tetrahedron Lett.* **1994**, *35*, 3281; e) M. A. Walters, A. B. Hoem, H. R. Arcand, A. D. Hegeman, C. S. McDonough, *Tetrahedron Lett.* **1993**, *34*, 1453; f) P. Molina, M. Alajarín, C. López-Leonardo, J. Alcántara, *Tetrahedron* **1993**, *49*, 5153; g) P. Molina, M. Alajarín, C .López-Leonardo, *Tetrahedron Lett.* **1991**, *32*, 4041; (h) M. A. Walters, C. S. McDonough, P. S., Jr. Brown, A. B. Hoem, *Tetrahedron Lett.* **1991**, *32*, 179; (i) K. C. Brannock, R. D. Burpitt, *J. Org. Chem.* **1965**, *30*, 2564.

[8] a) U. Nubbemeyer, *Top. Curr. Chem.* **2005**, *244*, 149; b) K. C. Majumdar, T. Bhattacharyya, B. Chattopadhyay, B. Sinha, *Synthesis* **2009**, *13*, 2117.

[9] L. Shang, Y. Chang, F. Luo, J.-N. He, X. Huang, L. Zhang, L, Kong, K. Li, B. Peng, *J. Am. Chem. Soc.* **2017**, *139*, 4211.

[10] a) K. E. Lutz, R. J. Thomson, *Angew. Chem. Int. Ed.* **2011**, *50*, 4437; b) U. Farid, T. Wirth, *Angew. Chem. Int. Ed.* **2012**, *51*, 3462; (c) T. Kitamura, R. Furuki, K. Nagata, H. Taniguchi, P. J. Stang, *J. Org. Chem.* **1992**, *57*, 6810; d) Y. Sun, X. Huang, X. Li, F. Luo, L. Zhang, M. Chen, S. Zheng, B. Peng, Adv. Synth. Catal. **2018**, doi: 10.1002/adsc.201701237.

[11] a) A. G. Davis, *Organotin Chemistry*, Wiley-VCH: Weinheim, **2004**; b) A. G. Davis, M. Gielen, K. H. Pannell, E. R. T. Tiekink, *Tin Chemistry-Fundamentals, Frontiers and Applications*; Wiley: United Kingdom, **2008**.

[12] For recent progresses of organotin chemistry: a) A. W. Schuppe, D. Huang, Y. Chen, T. R. Newhouse, *J. Am. Chem. Soc.* **2018**, DOI: 10.1021/jacs.7b13189; b) Y. Gu, R. Martin, *Angew. Chem. Int. Ed.* **2017**, *56*, 3187; c) C.-V. T. Vo, M. U. Luescher, J. W. Bode, *Nat. Chem.* **2014**, *6*, 310.

[13] For a comprehensive review on cyanoalkylation reactions: R. Lýpez, C. Palomo, *Angew. Chem. Int. Ed.* **2015**, *54*, 13170.

[14] For reactions of nucleophilic nitriles with aryl electrophiles: a) J. You, J. G. Verkade, *Angew. Chem. Int. Ed.* **2003**, *42*, 5051; b) L. Y. Wu, J. F. Hartwig, *J. Am. Chem. Soc.* **2005**, *127*, 15824; c) A. Klapars, J. H. Waldman, K. R. Campos, M. S. Jensen, M. Mclaughlin, J. Y. L. Chung, R. J. Cvetovich, C. Chen, *J. Org. Chem.* **2005**, *70*, 10186.

[15] For reactions between electrophilic nitriles and aryl nucleophiles: a) A. He, J. R. Falck, *J. Am. Chem. Soc.* **2010**, *132*, 2524; b) J. Choi, G. C. Fu, *J. Am. Chem. Soc.* **2012**, *134*, 9102; c) M. Nambo, M. Yar, J. D. Smith, C. M. Crudden, *Org. Lett.* **2015**, *17*, 50.

[16] For more details, see the supporting information.

[17] E. Christiansen, et al. *J. Med. Chem.* **2013**, *56*, 982.

[18] a) P. Moser, A. Sallmann, I. Wiesenberg, *J. Med. Chem.* **1990**, *33*, 2358; b) S. M. Hoy, *Drugs* **2016**, *76*, 1213; c) R. Altman, B. Bosch, K. Brune, P. Patrignani,; C. Young, *Drugs* **2015**, *75*, 859.

10.1002/anie.201803455

WILEY-VCH

Entry for the Table of Contents (Please choose one layout)

Layout 1:

COMMUNICATION

Text for Table of Contents

((Insert TOC Graphic here))

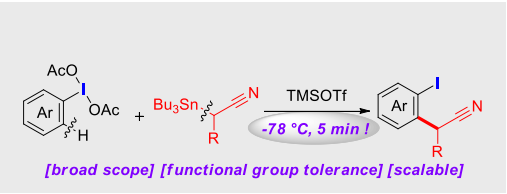
*Author(s), Corresponding Author(s)**

Page No. – Page No.

Title

Layout 2:

COMMUNICATION



*Author(s), Corresponding Author(s)**

Page No. – Page No.

Title

Speed wins: A robust cross-coupling of activated aryliodanes with α-stannyl nitriles is described. The unusually low reaction temperature and short reaction time enable the reaction to tolerate a large variety of functional groups. An unprecedented [3,3]-sigmatropic rearrangement is involved in the reaction.