Electronic Supplementary Material (ESI) for Reaction Chemistry & Engineering.


# Supporting Information

## A convenient numbering-up strategy for the scale-up of gas-liquid photoredox catalysis in flow

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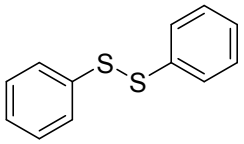
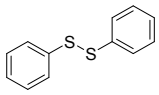
**Characterization of diphenyl disulfide**

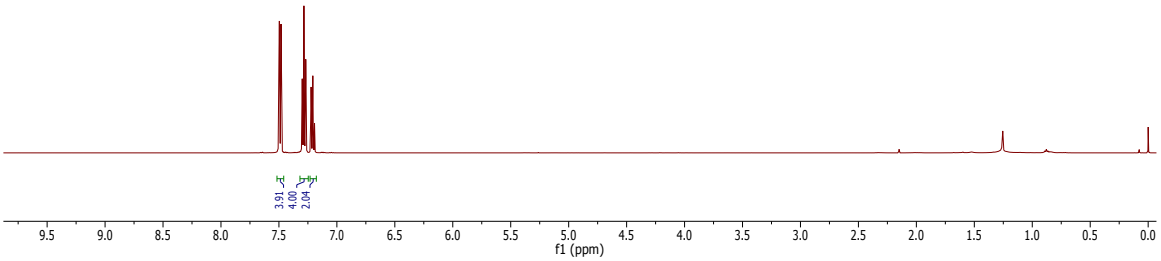


Mp.: 58.9-59.3 ºC (Lit: 59-61 ºC).[1] $^{1}$H NMR (400 MHz, $CDCl_3$) δ: 7.48 (td, *J* = 1.3, 7.5 Hz, 4H), 7.28 (tt, *J* = 1.3, 7.5 Hz, 4H), 7.21 (tt, *J* = 1.3, 7.5 Hz, 2H) ppm. $^{13}$C NMR (100 MHz, $CDCl_3$) δ: 127.4, 127.7, 129.3, 137.2 ppm. IR (ATR, $cm^{-1}$): 2955, 2920, 2853, 1574, 1474, 1458, 1437, 1020, 735, 685.

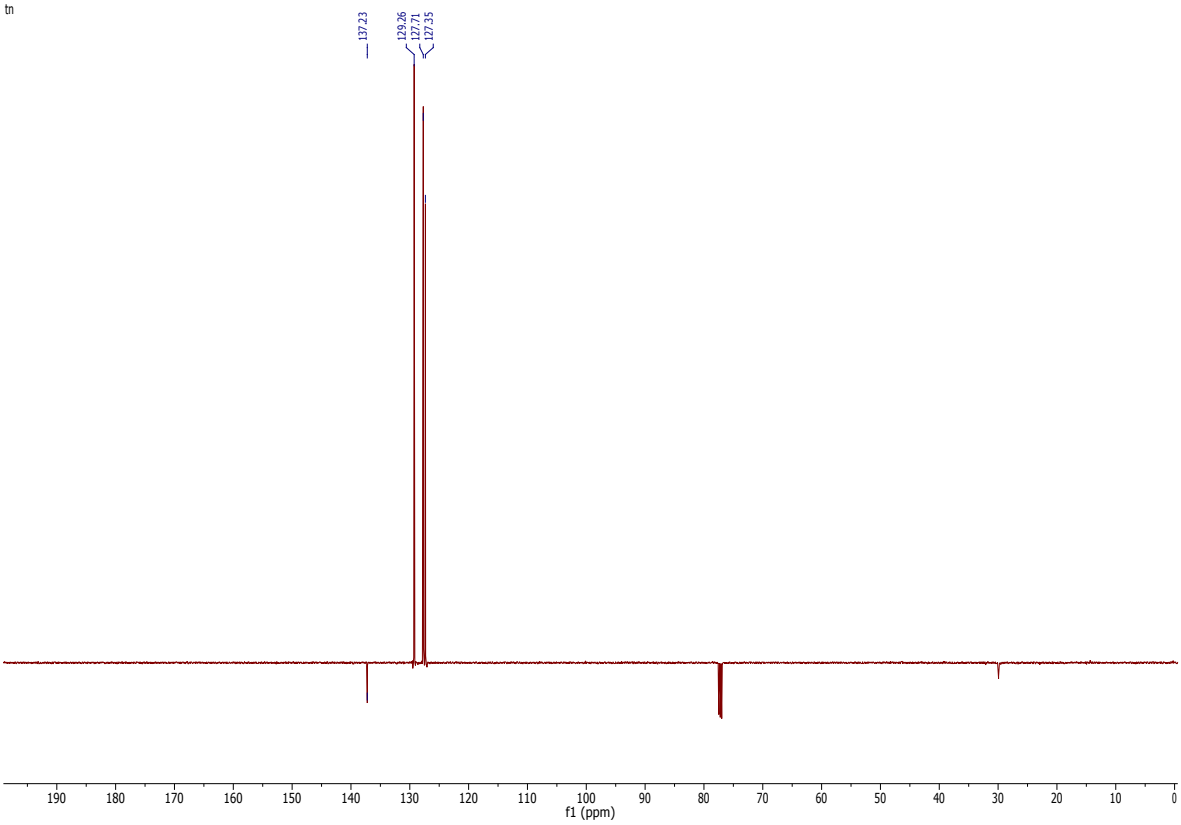
[1] R. Leino, J.-E. Lonnqvist, *Tetrahedron Lett.* **2004**, *45*, 8489-8491.



tn


3.91
4.00
2.04
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0
f1 (ppm)

tn


137.23
129.26
127.71
127.35
190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0
f1 (ppm)

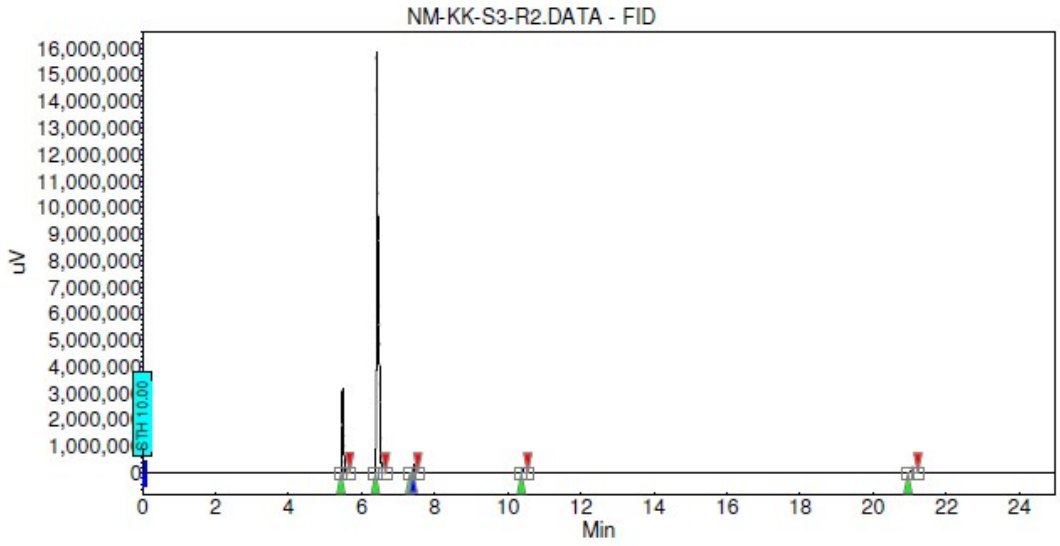
**GC-FID of the reaction mixture:**

GC analyses were performed on a GC-FID (Varian 430-GC) in combination with an auto sampler (Varian CP-8400).

**Chromatogram : NM-KK-S3-R2_channel1**

System : 430GC
Method : koen_1ml
User : Administrator

Acquired : 8/8/2015 1:31:32 AM
Processed : 8/8/2015 1:56:35 AM
Printed : 8/10/2015 10:54:09 AM




**Peak results :**

| Index | Name | Time [Min] | Quantity [% Area] | Height [uV] | Area [uV.Min] | Area % [%] |
|---|---|---|---|---|---|---|
| 1 | UNKNOWN | 5.48 | 11.31 | 3193204.8 | 135278.9 | 11.314 |
| 2 | UNKNOWN | 6.40 | 86.30 | 15861790.0 | 1031844.8 | 86.295 |
| 3 | UNKNOWN | 7.36 | 0.03 | 11487.0 | 396.5 | 0.033 |
| 4 | UNKNOWN | 7.45 | 0.77 | 317660.6 | 9242.9 | 0.773 |
| 5 | UNKNOWN | 10.42 | 0.30 | 114790.9 | 3561.4 | 0.298 |
| 6 | UNKNOWN | 21.09 | 1.29 | 239602.3 | 15391.7 | 1.287 |
| | | | | | | |
| Total | | | 100.00 | 19738535.6 | 1195716.2 | 100.000 |

The different signals can be attributed to ethanol as solvent ($t_R$ = 5.48), ethyl acetate as diluent to prepare the GC sample ($t_R$ = 6.40), trifluorotoluene as internal standard ($t_R$ = 7.45), thiophenol ($t_R$ = 10.42), diphenyldisulfide ($t_R$ = 21.09), respectively.