Pyrene-based metal-organic framework NU-1000 photocatalysed atom-transfer radical addition for iodoperfluoroalkylation and (Z)-selective perfluoroalkylation of olefins by visible-light irradiation

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3a-^{1}H

3a-^{13}C
3b-$^{13}$C

3b-$^{19}$F
3d-\textsuperscript{13}C

3d-\textsuperscript{19}F
$3e^{-19}F$

$3f^{-1}H$
3g-$^{19}$F

3g-HRMS (EI)

ztx180907-1 251 (4.184) Cm (251:264-110:144) TOF MS EI+
94.0427
7.14e4

91.0373 219.9394 389.0004 460.0124 586.0164 679.9504
95.0328 172.9279 220.9448 394.9916 552.0396 660.9513
681.9562

m/z
4h and 4h'-1H

4h and 4h'-13C
4h and 4h'-19F

4h and 4h'-HRMS

zbx180907-3 67 (1.102) Cm (67-44:50)

TOF MS EI+ 939

m/z
$3i^{-1}H$

$3i^{-13}C$
$3j^{13}$C

(E)-6a-$^1$H
(E)-6a-2D-NOESY

(Z)-6a-1H
(Z)-6a-\textsuperscript{13}C

(Z)-6a-\textsuperscript{19}F
(E)-6b-${}^{19}\text{F}$

(E)-6b-2D-NOESY
(Z)-7a-^{19}F

(Z)-7a-2D-NOESY
(Z)-7b-$^{19}$F

(2D-NOESY)
(Z)-7c-^1^H

(Z)-7c-^13^C
(Z)-7c-HRMS

ztx180907-2 612 (10.186) Cm (612:642-384:455)

TOF MS EI+ 8.15e4

m/z

641.1156
600.0875
561.0561
587.0721
696.1316
641.1156
698.1470
699.1517
712.1266
715.1439

60
50
100
150
200
250
300
350
400
450
500
550
600
650
700
750
800

%