Supporting Information

Alkylation/1,2-Aryl Migration of α-Aryl Allylic Alcohols with α-Carbonyl Alkyl Bromides Using Visible-Light Photoredox Catalysis

Yang Li, Bang Liu, Xuan-Hui Ouyang, Ren-Jie Song* and Jin-Heng Li*
State Key Laboratory of Chemo/Biosensing and Chemometrics, College of Chemistry and Chemical Engineering, Hunan University, Changsha 410082, China

E-mail: srj0731@hnu.edu.cn and jhli@hnu.edu.cn

List of Contents

(A) Typical experimental procedure S2

(B) Spectra S3-S44

(C) The X-ray single-crystal diffraction analysis of 3na S44
(A) Typical experimental procedure

(a) Figure S1. An off/on light profile over time

As shown in Figure S1, the additional visible light is necessary for the current reaction: the reaction successfully proceeds upon irradiation with light, but the absence of the additional visible light results in no further conversion of 1a. These results suggest that the current reaction follows a photoredox mechanism.
(B) Spectra

1,2,5-Triphenylpentane-1,5-dione (3aa)
1,2-Diphenyl-5-(p-tolyl)pentane-1,5-dione (3ab)
5-(4-Methoxyphenyl)-1,2-diphenylpentane-1,5-dione (3ac)
5-(4-Fluorophenyl)-1,2-diphenylpentane-1,5-dione (3ad)
4-(5-Oxo-4,5-diphenylpentanoyl)benzonitrile (3ae)
Ethyl 5-oxo-4,5-diphenylpentanoate (3af)
4-Methyl-1,2-diphenylhexane-1,5-dione (3ag)
Methyl 2-methyl-5-oxo-4,5-diphenylpentanoate (3ah)
$N,2$-Dimethyl-5-oxo-$N,4,5$-triphenylpentanamide (3ai)
2-Methyl-4,5-diphenyl-1-(piperidin-1-yl)pentane-1,5-dione (3aj)
Methyl 2-acetyl-2-ethyl-5-oxo-4,5-diphenylpentanoate (3ak)
Diethyl 2-methyl-2-(3-oxo-2,3-diphenylpropyl)malonate (3al)
Ethyl 2,2-difluoro-5-oxo-4,5-diphenylpentanoate (3am)
5-Phenyl-1,2-di-p-tolylpentane-1,5-dione (3ba)
1,2-Bis(4-chlorophenyl)-5-phenylpentane-1,5-dione (3ca)
1,2-Bis(4-bromophenyl)-5-phenylpentane-1,5-dione (3da)
2,5-Diphenyl-1-(p-tolyl)pentane-1,5-dione (3ea)
1-(4-Methoxyphenyl)-2,5-diphenylpentane-1,5-dione (3fa)
2-(4-Chlorophenyl)-1,5-diphenylpentane-1,5-dione (3ga)
1,5-Diphenyl-2-(4-(trifluoromethyl)phenyl)pentane-1,5-dione (3ha)
1,5-Diphenyl-2-(m-tolyl)pentane-1,5-dione (3ia)
1,5-Diphenyl-2-(3-(trifluoromethyl)phenyl)pentane-1,5-dione (3ja)
H-H NOSEY

HSQC
1-(3,4-Dimethylphenyl)-2,5-diphenylpentane-1,5-dione (3ka)
2-(3,4-Dichlorophenyl)-1,5-diphenylpentane-1,5-dione (3la)
2,5-Diphenyl-1-(o-tolyl)pentane-1,5-dione (3ma)

[Chemical structure diagram]

[Graphs and data]
1-(2-Chlorophenyl)-2,5-diphenylpentane-1,5-dione (3na)
2,5-Diphenyl-1-(2-(trifluoromethyl)phenyl)pentane-1,5-dione (30a)
1-(2,5-Difluorophenyl)-2,5-diphenylpentane-1,5-dione (3pa)
1-(2-Chlorophenyl)-2-(4-chlorophenyl)-5-phenylpentane-1,5-dione (3qa)
2-(Naphthalen-1-yl)-1,5-diphenylpentane-1,5-dione (3ra)
1,5-Diphenyl-2-(thiophen-2-yl)pentane-1,5-dione (3sa)

H-H cosy
1,4-Diphenylhexane-1,5-dione (3ta)
Ethyl 5-(2-chlorophenyl)-2,2-difluoro-5-oxo-4-phenylpentanoate (3nh)
Diethyl 2-(3-(2-chlorophenyl)-3-oxo-2-phenylpropyl)-2-methylmalonate (3ni)
Ethyl 5-(2-chlorophenyl)-2,2-difluoro-5-oxo-4-phenylpentanoate (3nm)
(C) The X-ray single-crystal diffraction analysis of 3na

![Chemical Structure Image]