Jones, K. E.; Park, B.; Doering, N. A.; Baik, M.-H.; Sarpong, R. J. Am. Chem. Soc. 2021, 143, 20482-20490

$67 \%$ if one pot ( $+1,4$-cyclohexadiene)



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(S)-verbenone




full conv. after 17 h

$$
\begin{array}{|c}
\text { THPO } \\
\text { (2.0 equiv.) } \\
\text { EtMgBr (2.0 equiv.) } \\
\text { THF } \\
81 \%
\end{array}
$$


 $67 \%$ if one pot ( $+1,4$-cyclohexadiene)



PIDA (3.0 equiv.)
$\quad \mathrm{I}_{2}$ (1.0 equiv.)

$$
\begin{gathered}
\text { white light } \\
96 \%
\end{gathered}
$$

$$
\begin{aligned}
& \text { w6\% }
\end{aligned}
$$

1) $\mathrm{AIBN}, \mathrm{Bu}_{3} \mathrm{SnH}, \mathrm{PhH}, 83 \%$ 2) $\mathrm{K}_{2} \mathrm{CO}_{3}, \mathrm{MeOH}, 76 \%$




path b
racemisation pathway
$\mathrm{Me} \overbrace{\mathrm{Me}}^{\sim}$
Hurst, J. J.; Whitham, G. H. J.Chem. Soc. 1960, 2864-2869 Erman, W. F. J. Am. Chem. Soc. 1967, 89, 3828-3841


> 1) $\widehat{M g B r}$ (3.0 equiv.) $\mathrm{CuBr} \cdot \mathrm{Me}_{2} \mathrm{~S}(18 \mathrm{~mol} \%)$
> 2) $\mathrm{Li}^{0}, \mathrm{NH}_{3}, \mathrm{MeOH},-78{ }^{\circ} \mathrm{C} \mathrm{C}, 70 \%$.


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Chirumarry, S.; Jang, K.; Yoon, Y.-J.; Falck, J. R.; Shin, D.-S. Tetrahedron Lett. 2015, 56, 7089-7093

