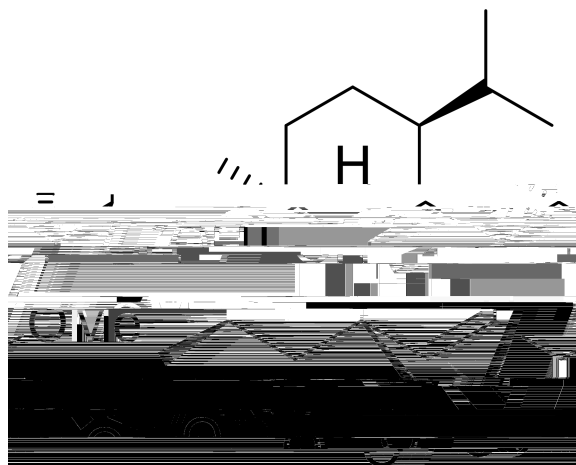


$\text{C}_2\text{H}_5\text{MgBr} + \text{CH}_3\text{COCl} \rightarrow \text{CH}_3\text{C}(\text{O})\text{CH}_2\text{CH}_2\text{MgBr}$
 &fĩ ċ' ()* (+* ffl ' / ċ' (~ (Angew. Chem. Int. Ed. 2015, 54, . //01. //2(



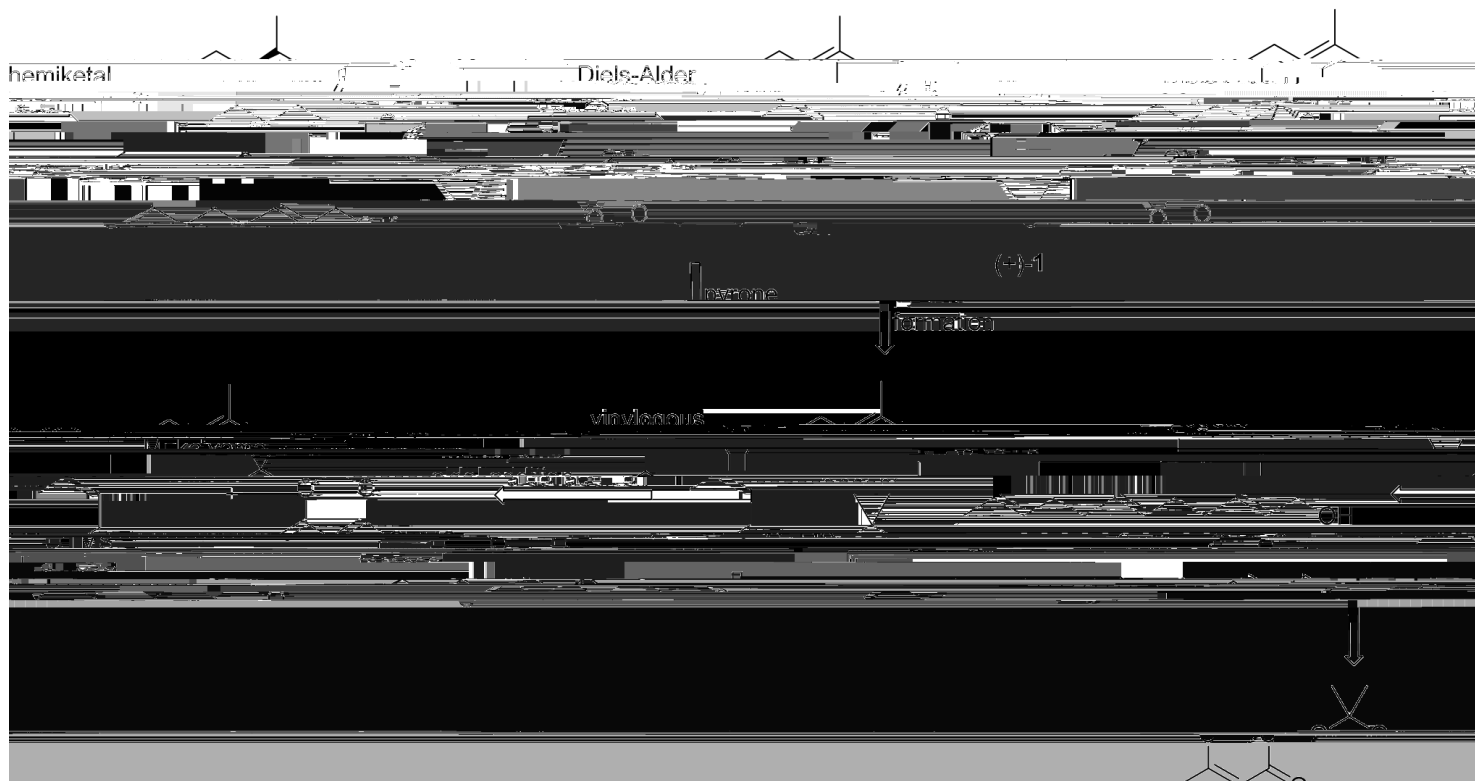
&fž ċ' #~3 (~4 f5L''fi
 6f5~4 °' 57
 -fŸ 5fĩ #. ċ' /8. 2

9°! fl 5L~ #/ ~ | 1 1 1

F Enantioselective synthesis achieved by Deslongchamps in 2003.

F

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F Exceedingly acid-sensitive hemiketal moiety formed in the penultimate step.

F Intramolecular Diels-Alder cyclization with pyrone diene to set four of the final product's seven stereocenters.

F Vinylogous Mukaiyama aldol addition to combine two fragments containing all necessary carbon atoms.

D

X' °B fi; ~ #/ ~ 1 7fL

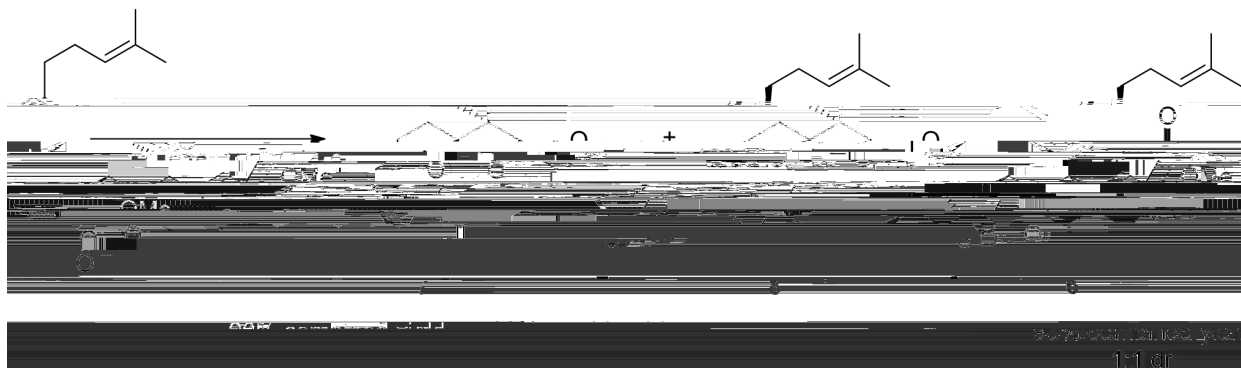
K* 9YK11)* fi'f'7i °fi; f'f'f'
&~ fi' ~ ()* (+* f'f' /' /' ~" (~(Angew. Chem. Int Ed. 2015, 54, . //01. //2(
1 7'Z! 1L, W(i (+-5L'f'f'f'~-(+<fL; f'<(+X5f/ 1L, [(+9f'f' fL,* (+%~ ' \5f 7fZ)6fL9.

X' °B fi; ~ #/ ~ t 7fl



6K > Y ZT f5, ; flL 7° 7#Zi, flt +K* 9YKtE)* fi "fl ~7t °fl; fl flt +K: 9t > Y N,N-; flL 7° 7#Zi) t ~ #Zi flt
 & fi ~ 0)* (+* fl) /t ~ (- (Angew. Chem. Int. Ed. 2015, 54, . //01. //2(
 Xt ~t E~> +%fi t flfi i (~* (J. Org. Chem. 2003, 68, MUQ1MEO(

X' °B fi; ~ #/ ~ 1 7fl



F Diastereomers 7 and 8 separable by column chromatography.

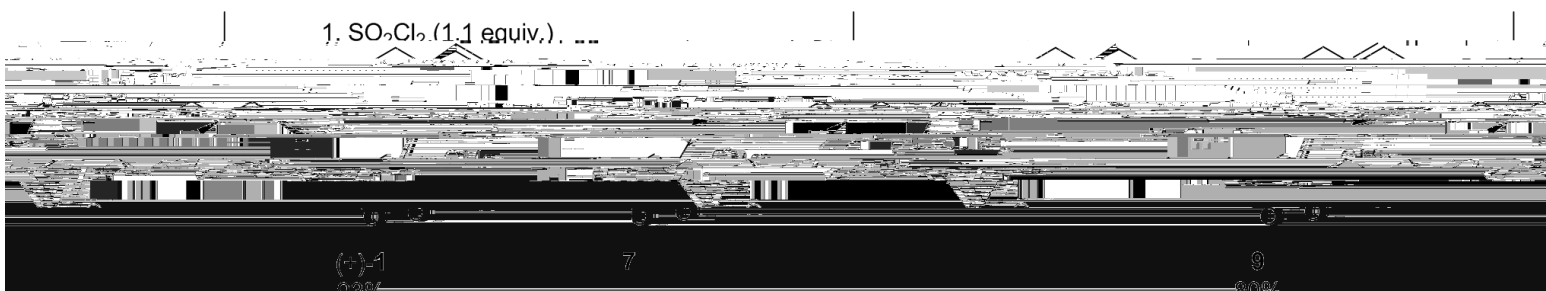
F Only decarboxylated products obtained when attempted with triflate 5.

F Significant decarboxylation also observed in more polar solvents (DMF, acetonitrile), and at higher temperatures (120 °C).

F Cyclization reaction was markedly sluggish at 80 °C.

E

X' °B fi; ~ #/ ~ 1 7fl

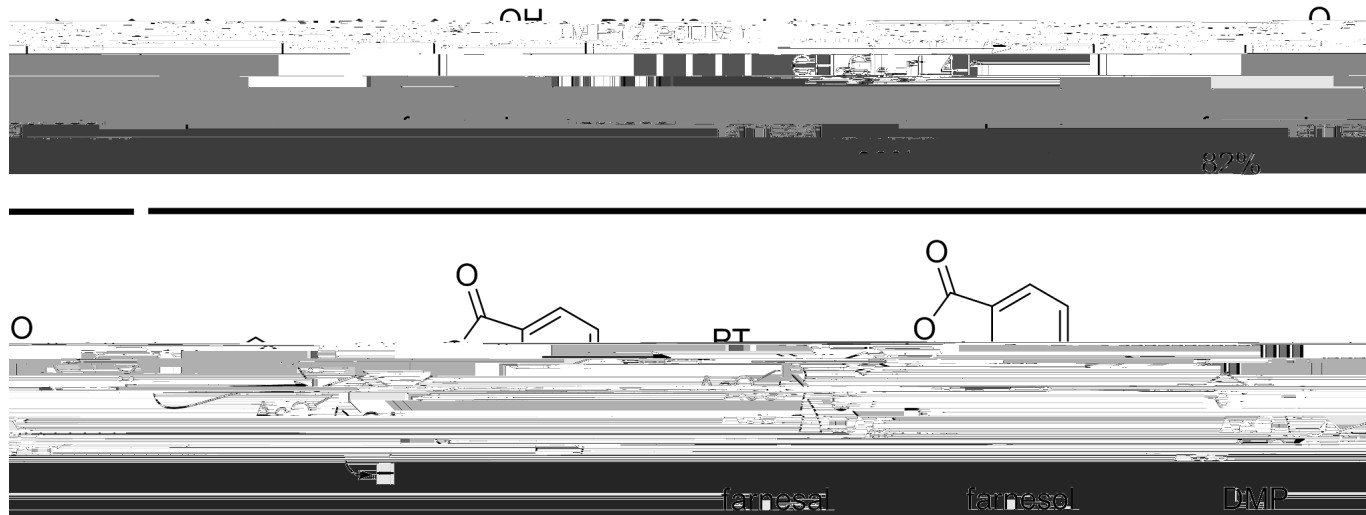


M

& fi ~ ()* (+* fl) ' / t ~ (- (Angew. Chem. Int. Ed. 2015, 54, . //01. //2(

* 1 ž f/f, t_

K t t)* fi "f/ 9l ° fl; f/f f/ t ~@Sf/ fi'f/ /



1 t'Z! t L, W(i (-5t "fzffl~-(+<fL; fl<(+X5l / 1 t_ [(+9fi'fi fL_* (+%~ ' \5t t fZ) 6fLfi'1 ,K (+4 fi'z]fi~-(~* (+W l ž t_ W(+
 ~~~~4 f/f tP5t °, > (+%5t ! fi~-(~\* (+@ž"fi~-(i (Chem. Eur. J. 2009, 15, //UQ1/UM(

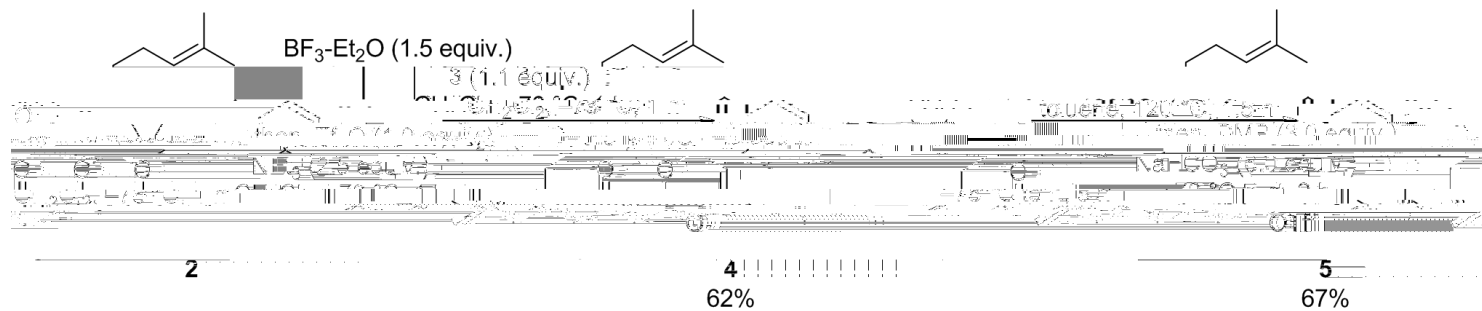
\* 1 ž f/f, t



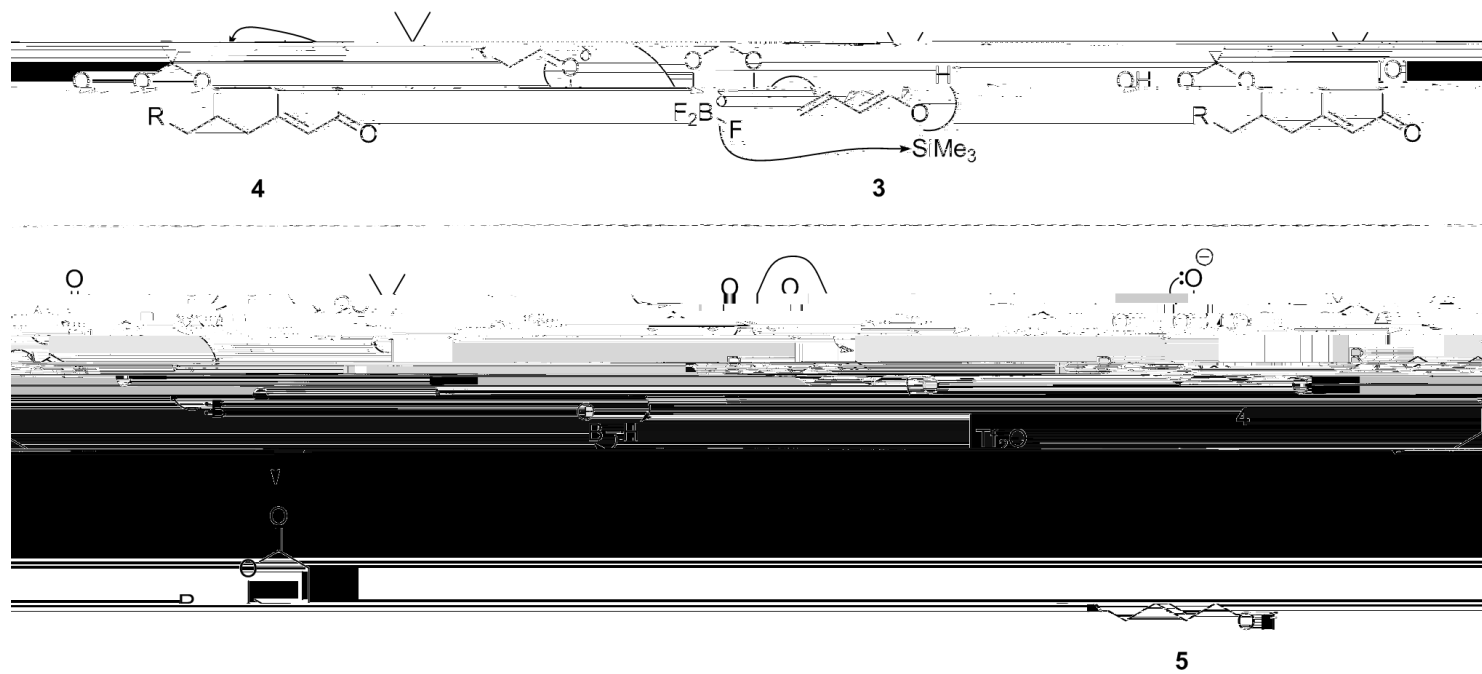
./

\* f#1 ° (ř6fl< (Angew. Chem. Int. Ed. 2006, 45, Q M01Q M0X)

# \* 1 ž f/ fl, t



vinylogous Mukaiyama aldol addition



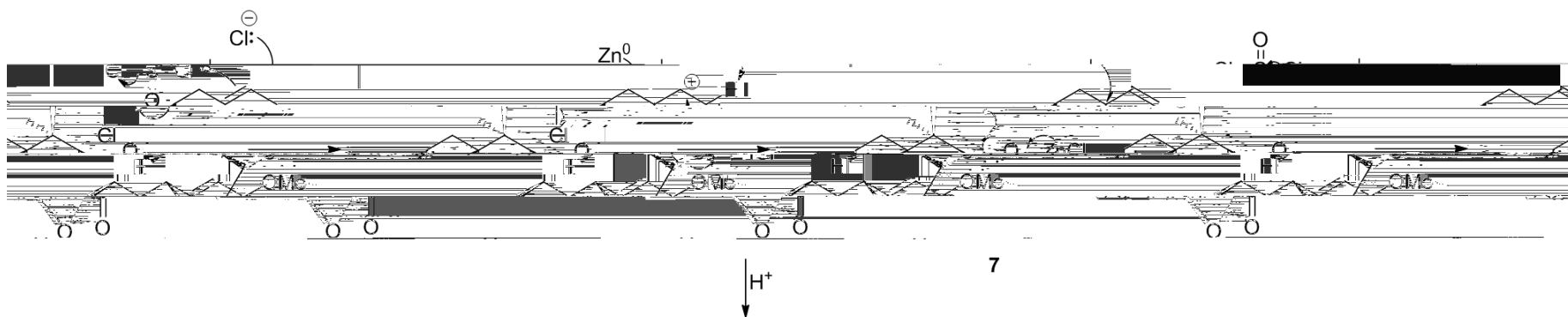
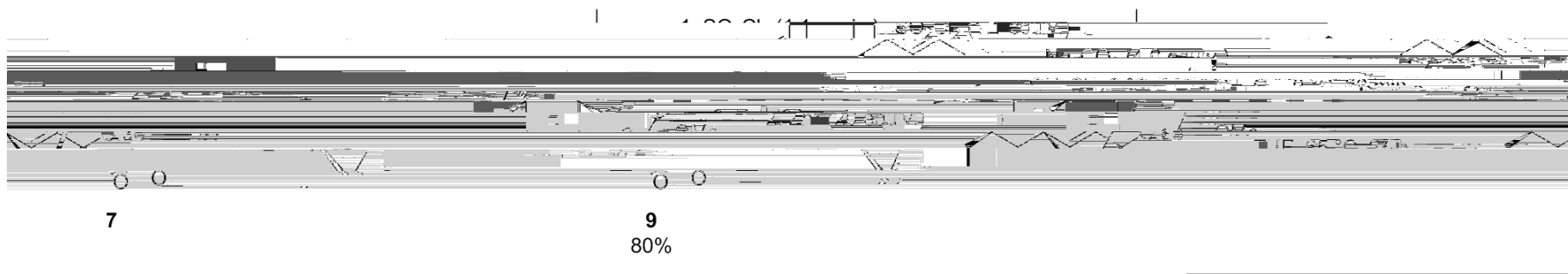
\* 1 ž ~ f/x fl, 7

\* 1 ž ~ f/x fl, 7

.D

& fi 2 0\* (+\* ffl) ' / 2 " (-(-

\* 1 ž ~ fi/fl, t



FA hemiketal formation mechanism involving intramolecular attack of a zincate on the lactone carbonyl is also plausible.

