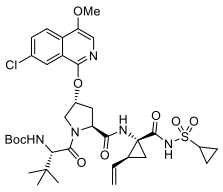


Problem

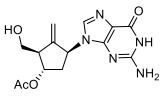
Synthesis of Asunaprevir and Entecavir

1. Asunaprevir (BMS-650032)
Bristol-Myers Squibb Research and Development-BMS
Ref. *J. Med. Chem.* **2014**, *57*, 1730–1752.





1, Asunaprevir
Treatment: Hepatitis C virus infection

2. Entecavir (Baraclude)
Bristol-Myers Squibb Research and Development-BMS
Ref. *1. Bioorg. Med. Chem. Lett.* **1997**, *7*, 127-132
. Farras and Gasanz et al. J. Org. Chem. **2013**, *78*, 5482–5491.

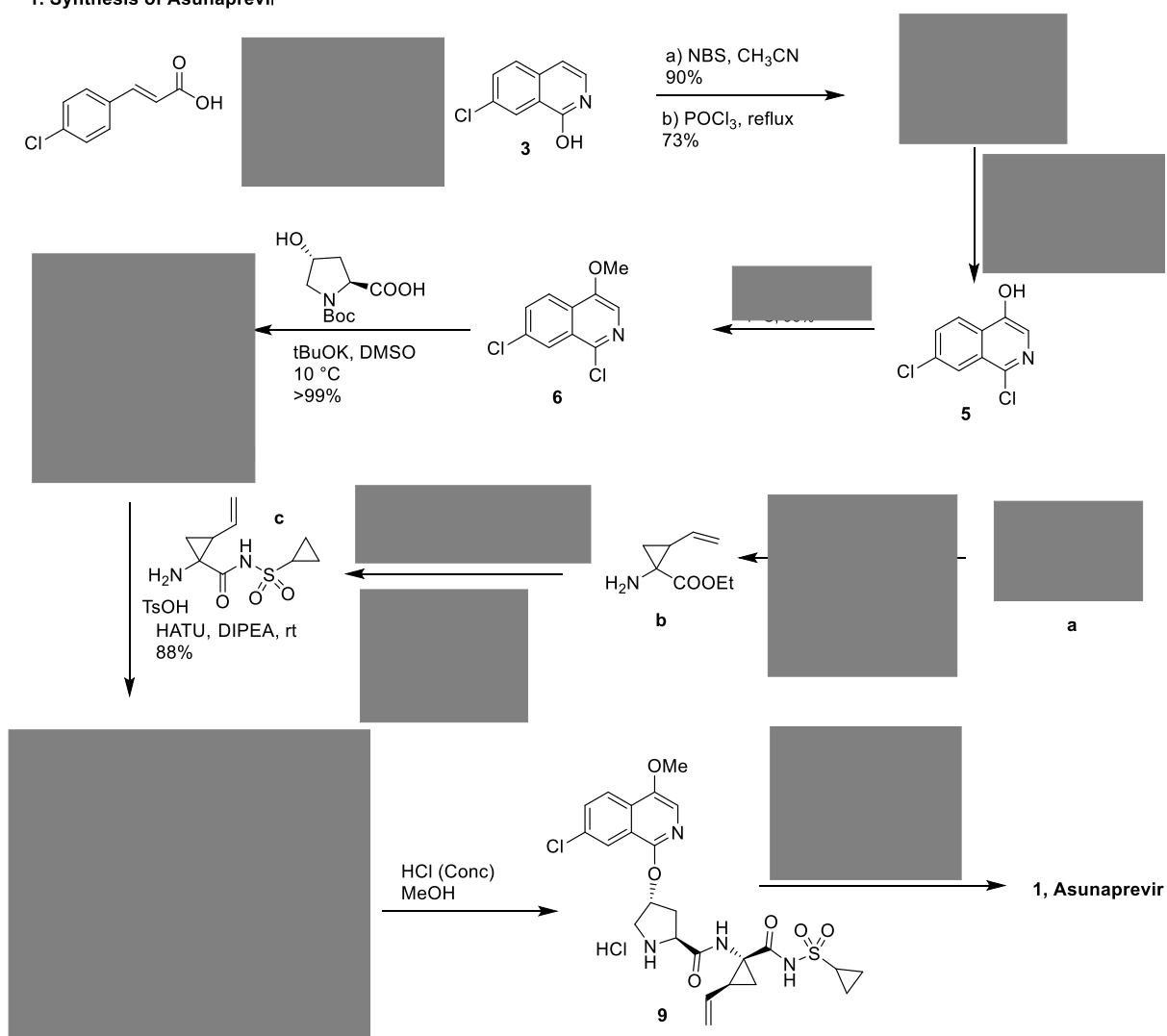


2, Entecavir (Baraclude)
Anti-Hepatitis B virus activity in-vitro

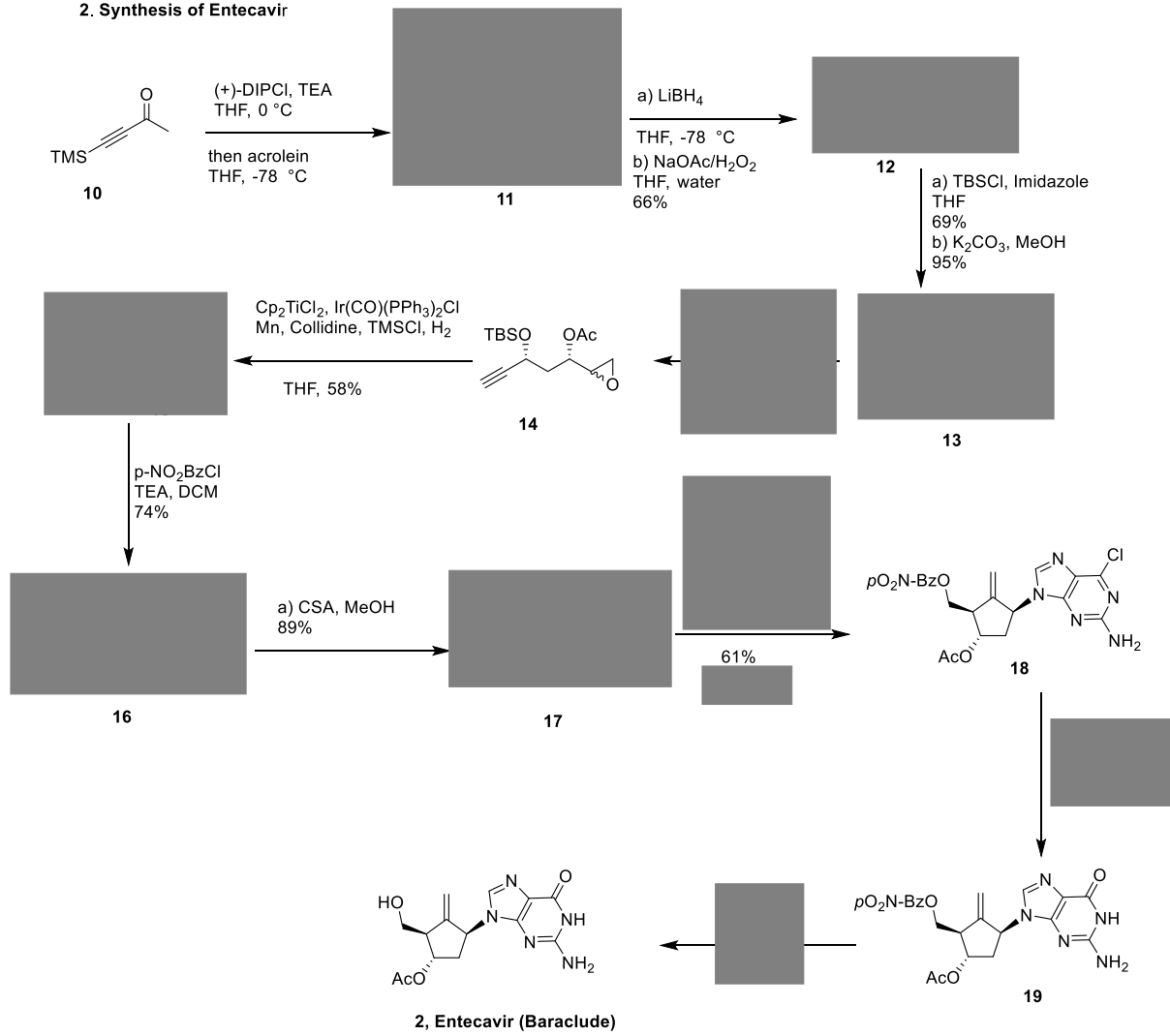



1. WHO estimated that in 2016, approximately 399 000 people died from hepatitis C
 2. WHO estimates that in 2015, 257 million people were living with chronic hepatitis B infection
 3. They can be prevented by vaccines that are safe

1. Synthesis of Asunaprevir

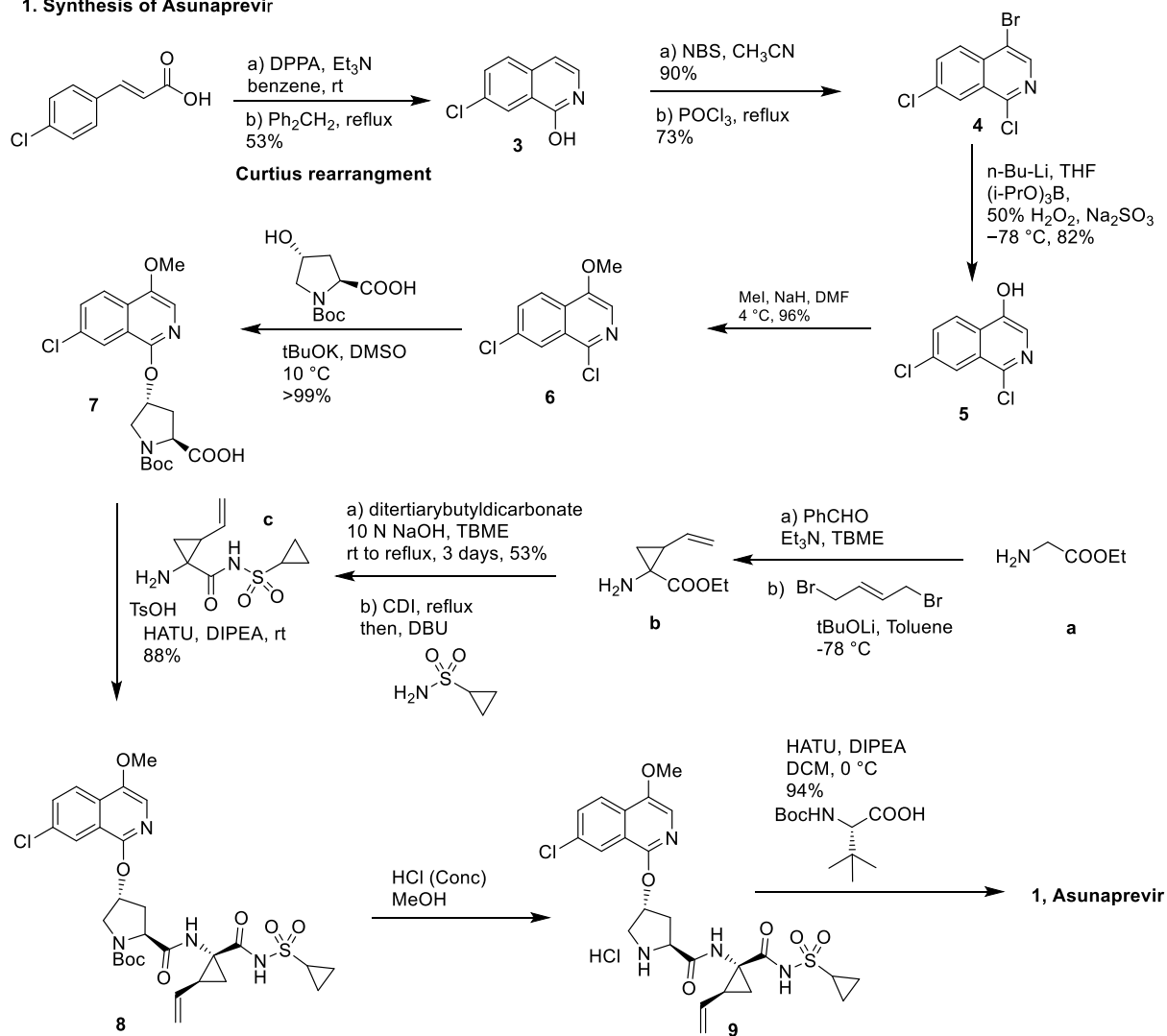


2. Synthesis of Entecavir

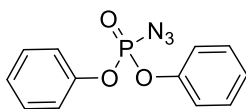
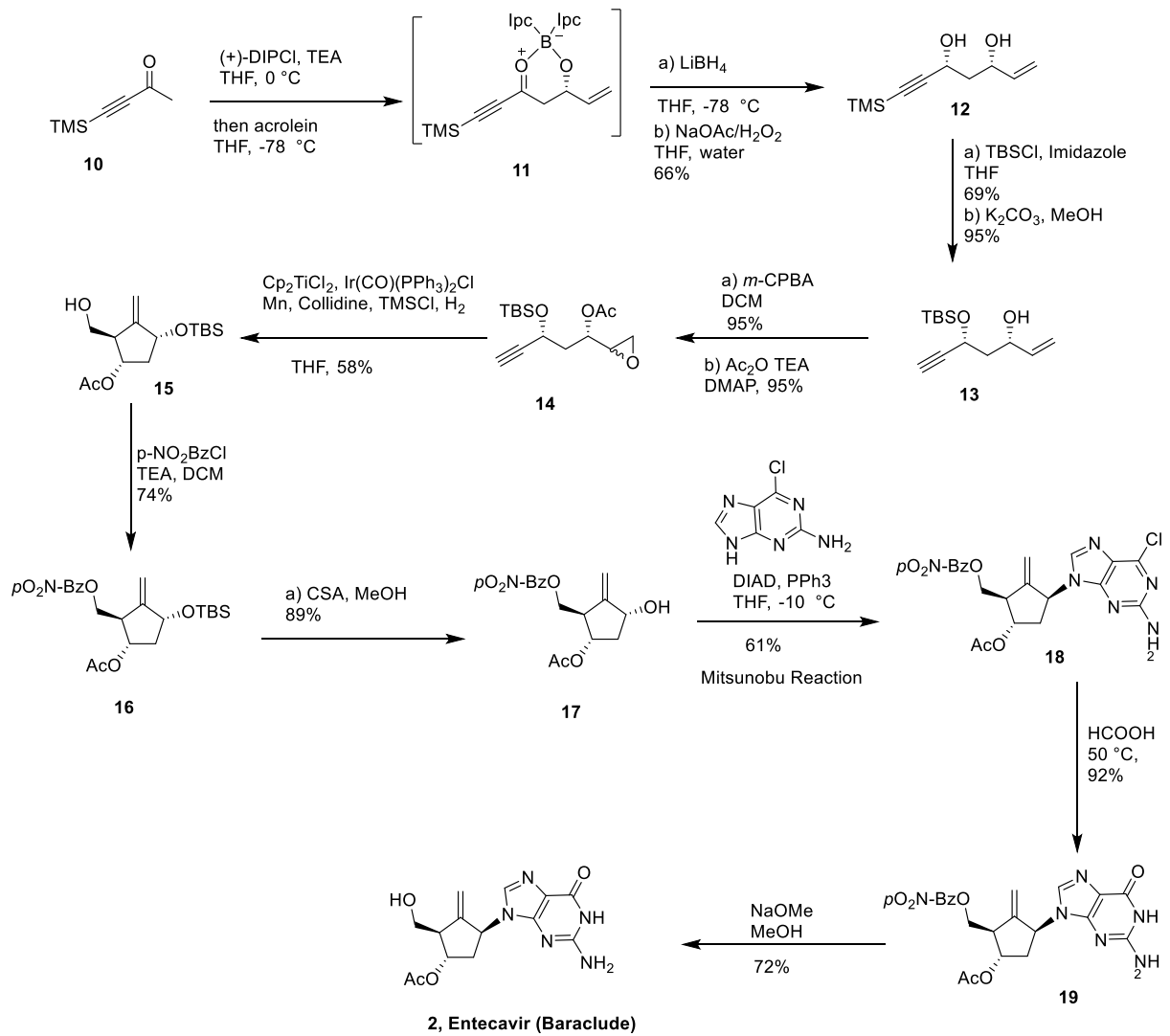


Solution

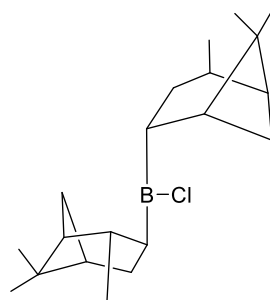
1. Synthesis of Asunaprevir



2. Synthesis of Entecavir



Diphenylphosphoryl azide (DPPA)



(+)-lpc2BCl, (+)-B-Chloridiisopinocampheylboran
(+)-DIPICl

