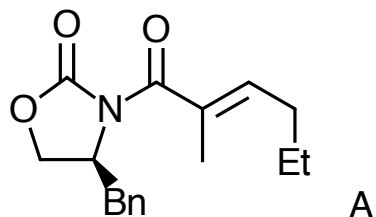


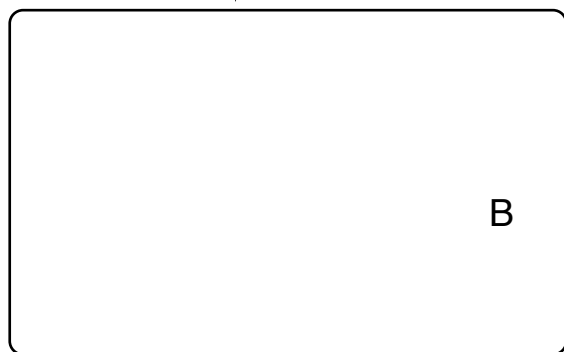
# Synthesis Challenge # 37

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23.07.2015



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6-9



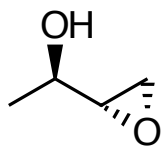
- 1) NaHMDS, THF,  $-78^{\circ}\text{C}$ ; then TBSCl
- 2) (*E*)-3-iodo-2-methylacrylaldehyde,  $\text{TiCl}_4$ ,  $\text{CH}_2\text{Cl}_2$ ,  $-78^{\circ}\text{C}$  to  $-30^{\circ}\text{C}$
- 3) *para*-nitrobenzoic acid, DEAD,  $\text{PPh}_3$ , THF,  $0^{\circ}\text{C}$
- 4)  $\text{NaBH}_4$ , THF/ $\text{H}_2\text{O}$
- 5)  $\text{MnO}_2$ ,  $\text{CH}_2\text{Cl}_2$

- 6) (-)- $\text{Ipc}_2\text{B}(\text{allyl})$ ,  $\text{Et}_2\text{O}$ ,  $-78^{\circ}\text{C}$  then aq.  $\text{NaBO}_3$
- 7) TBSOTf, 2,6-lutidine,  $\text{CH}_2\text{Cl}_2$
- 8)  $\text{K}_2\text{CO}_3$ ,  $\text{MeOH}/\text{H}_2\text{O}$
- 9) TESOTf, 2,6-lutidine,  $\text{CH}_2\text{Cl}_2$

How would you prepare compound A

Please, provide detailed mechanism for step 2.

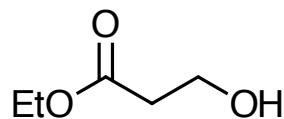
Please provide a detailed mechanism for step 6).



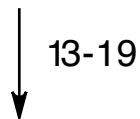
D



E



F



G

- 10) TBSCl, Imid, CH<sub>2</sub>Cl<sub>2</sub>
- 11) propyne, *n*BuLi, BF<sub>3</sub>·Et<sub>2</sub>O, THF, -78°C to 0°C
- 12) Pd(OAc)<sub>2</sub>, PCy<sub>3</sub>, Bu<sub>3</sub>SnH, hexane

- 13) LDA (3.5 equiv), THF, -78°C; then acrolein, -78°C
- 14) Me<sub>2</sub>SnCl<sub>2</sub> (10 mol%), TBSCl, Et<sub>3</sub>N
- 15) Ac<sub>2</sub>O, Et<sub>3</sub>N, DMAP, CH<sub>2</sub>Cl<sub>2</sub>
- 16) DBU, CH<sub>2</sub>Cl<sub>2</sub>, *E*:*Z*=5.5:1
- 17) DIBAH, CH<sub>2</sub>Cl<sub>2</sub>, -10°C;
- 18) MnO<sub>2</sub>, CH<sub>2</sub>Cl<sub>2</sub>
- 19) NaClO<sub>2</sub>, KH<sub>2</sub>PO<sub>4</sub>, 2-methyl-2-butene, tBuOH/H<sub>2</sub>O

How would you prepare compound D?

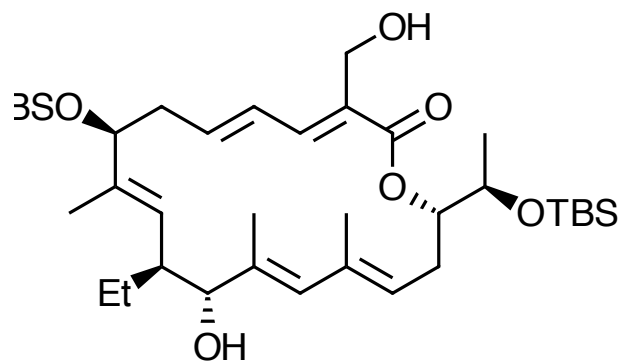
Please provide a detailed mechanism for step 12).

Please provide a detailed mechanism for step 13).

What is the name of the reaction in step 19)

C

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20) **E**, CuTC, [Pd(PPh<sub>3</sub>)<sub>4</sub>],  
[Bu<sub>4</sub>N]<sup>+</sup>[Ph<sub>2</sub>PO<sub>2</sub>]<sup>-</sup>, DMF  
21) **G**, Cl<sub>3</sub>C<sub>6</sub>H<sub>2</sub>COCl, Et<sub>3</sub>N, DMAP,  
PhMe  
22) Grubbs cat. II (15 mol %), PhMe,  
40°C (microwave irradiation), 10 min,  
E/Z = 2:3 ; then 100 °C, 18 h, E/Z = 2 :1  
23) HF·Et<sub>3</sub>N, THF/MeCN 1:1,  
0°C to 23°C

Please provide a detailed mechanism for  
steps 20)-22).