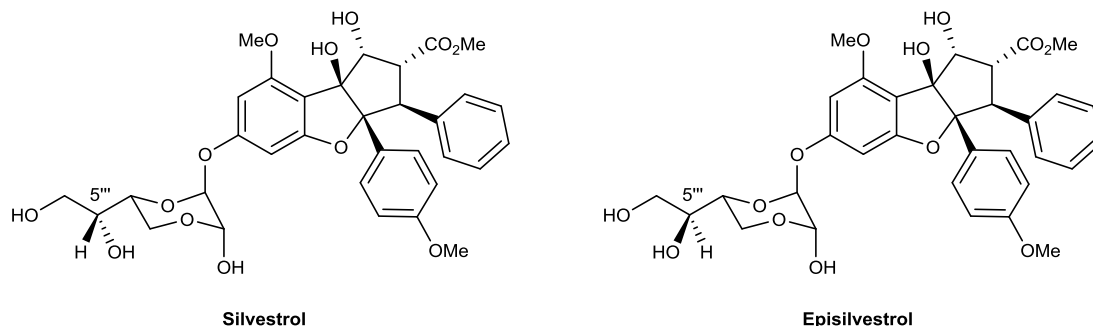


The rocaglate derivatives Silvestrol and Episilvestrol, isolated from the fruits and twigs of the woody plant species *Aglaia*, has been found to show very potent in vitro cytotoxic activity against several human cancer cell lines comparable to that of the well-known anticancer drug paclitaxel (Taxol®).



Below is a portion of the total synthesis of (-)-Silvestrol and (-)-Episilvestrol. Please provide reagents, conditions and intermediates where indicated as well as mechanisms for all steps.

1) Ag_2CO_3 , PMB-OH
2) ?
3) $\text{PhCH}(\text{OMe})_2$
CSA, CH_3CN

NaIO₄

DiBALH
THF, 0°C

BuLi, MeOTf
-78°C, THF

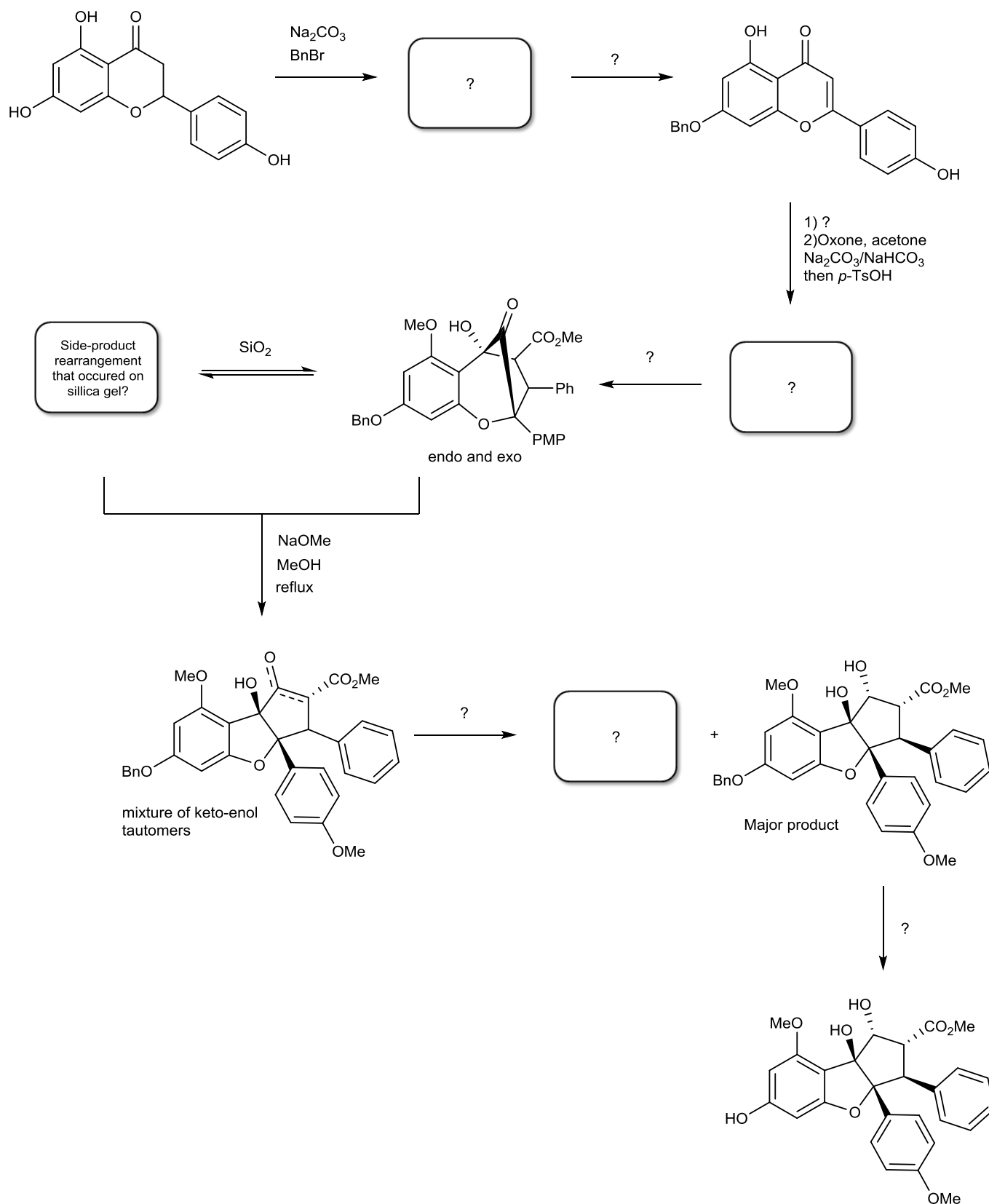
1) ?
2) ?

1) ?
2) ?

Episilvestrol dioxane

Silvestrol dioxane

Synthesis of the Cyclopentabenzofuran Core



What is the name of the reaction that couples these two portions together (DIAD, Ph_3P , 0°C , 2 h)?

Give a reason for the stereochemistry achieved.