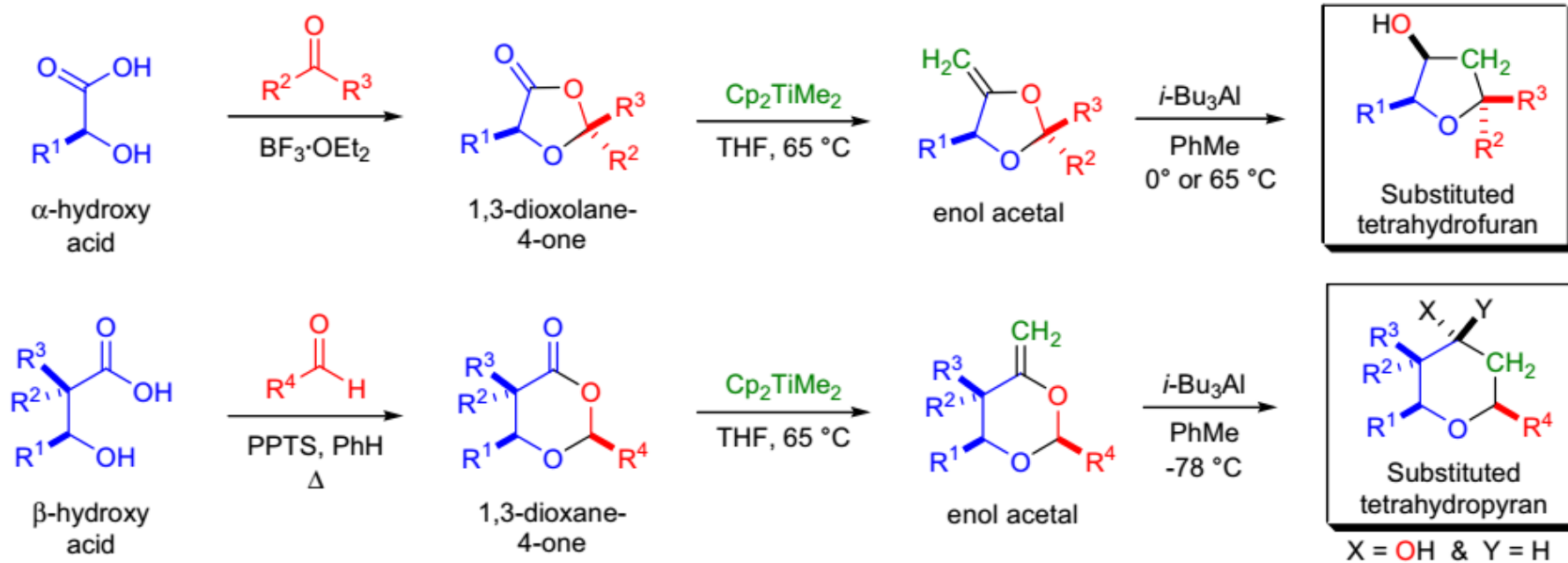


PETASIS-FERRIER REARRANGEMENT

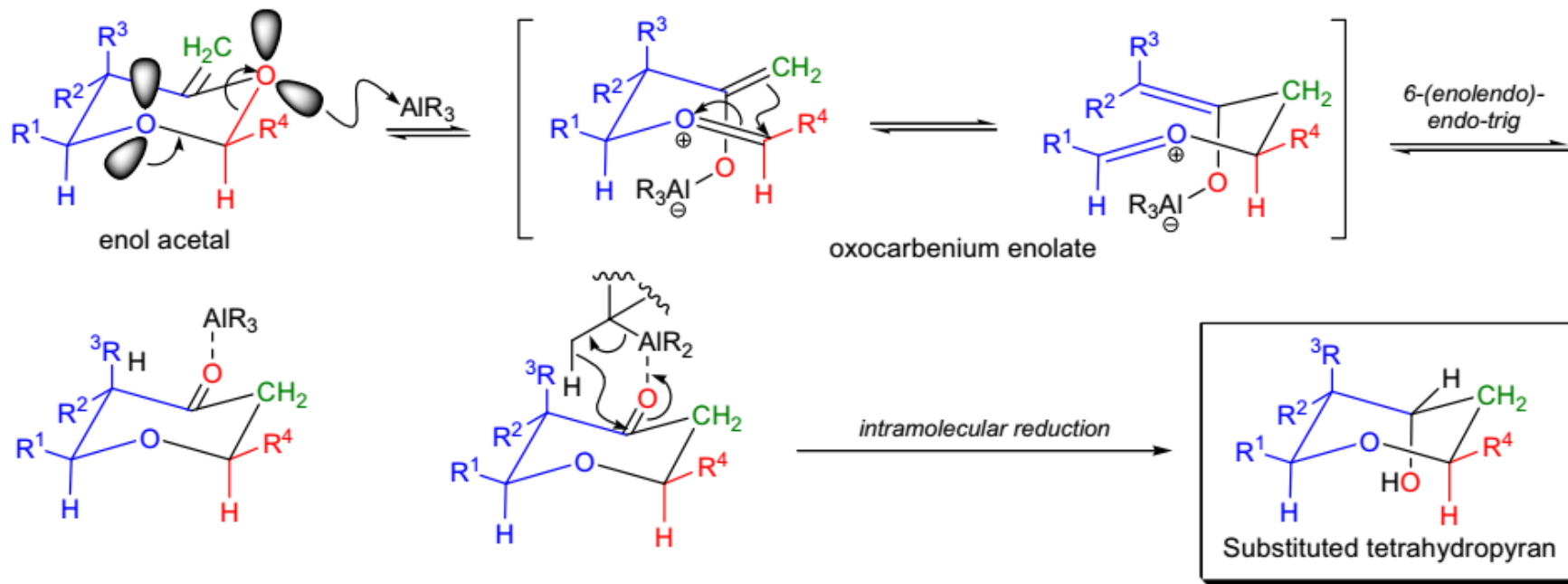
Ming-Liang Lou
11/29/2016

What's the Petasis-Ferrier Rearrangement

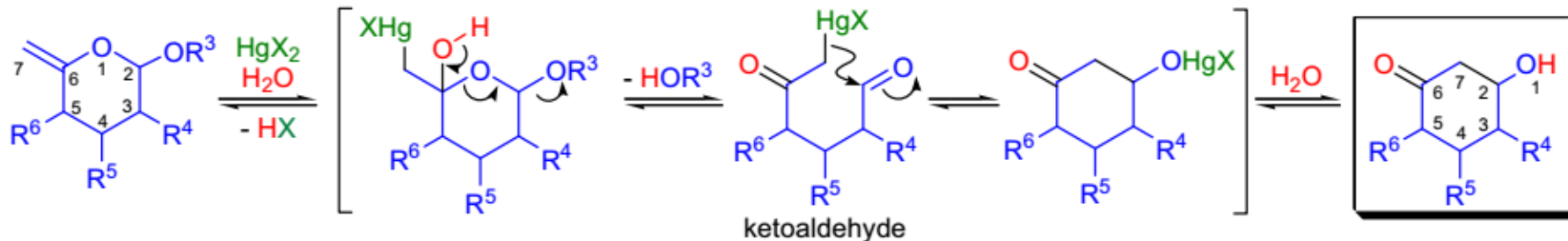


The stereocontrolled Lewis acid-promoted rearrangement of cyclic enol acetals to the corresponding substituted tetrahydrofurans and tetrahydropyrans is called the Petasis-Ferrier rearrangement.

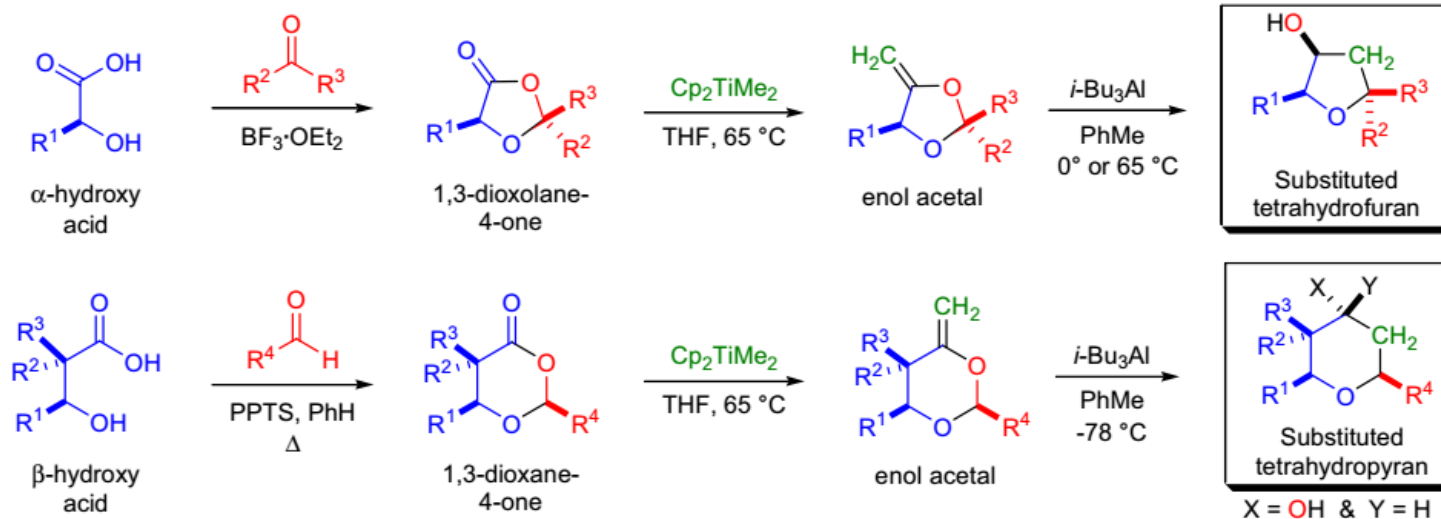
Mechanism of the Petasis-Ferrier Rearrangement



Type II Ferrier Rearrangement



Features of the Petasis-Ferrier Rearrangement



- 1) the configuration of the acetal carbon is retained or enhanced during the rearrangement;
- 2) the rearrangement of five-membered enol acetals takes place at a much higher temperature than for the six-membered substrates;
- 3) trialkylaluminums were found to be the most effective reagents to mediate the rearrangement ($i-Bu_3Al$, Me_3Al , Me_2AlCl being the most common);
- 4) the stereoselectivity of the aluminum-mediated carbonyl reduction (very last step) depends on the substitution pattern and occurs when $i-Bu_3Al$ is used (the reduction does not take place with Me_2AlCl);
- 5) a drawback of the procedure is that the olefination step can lead to a mixture of olefin stereoisomers when the applied titanocene is other than dimethyl titanocene

Applications of the Petasis-Ferrier Rearrangement

