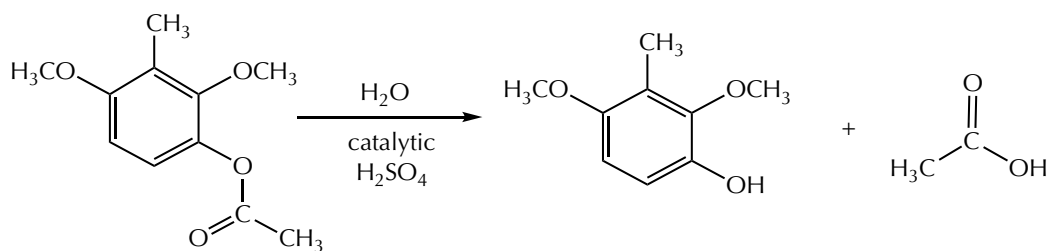
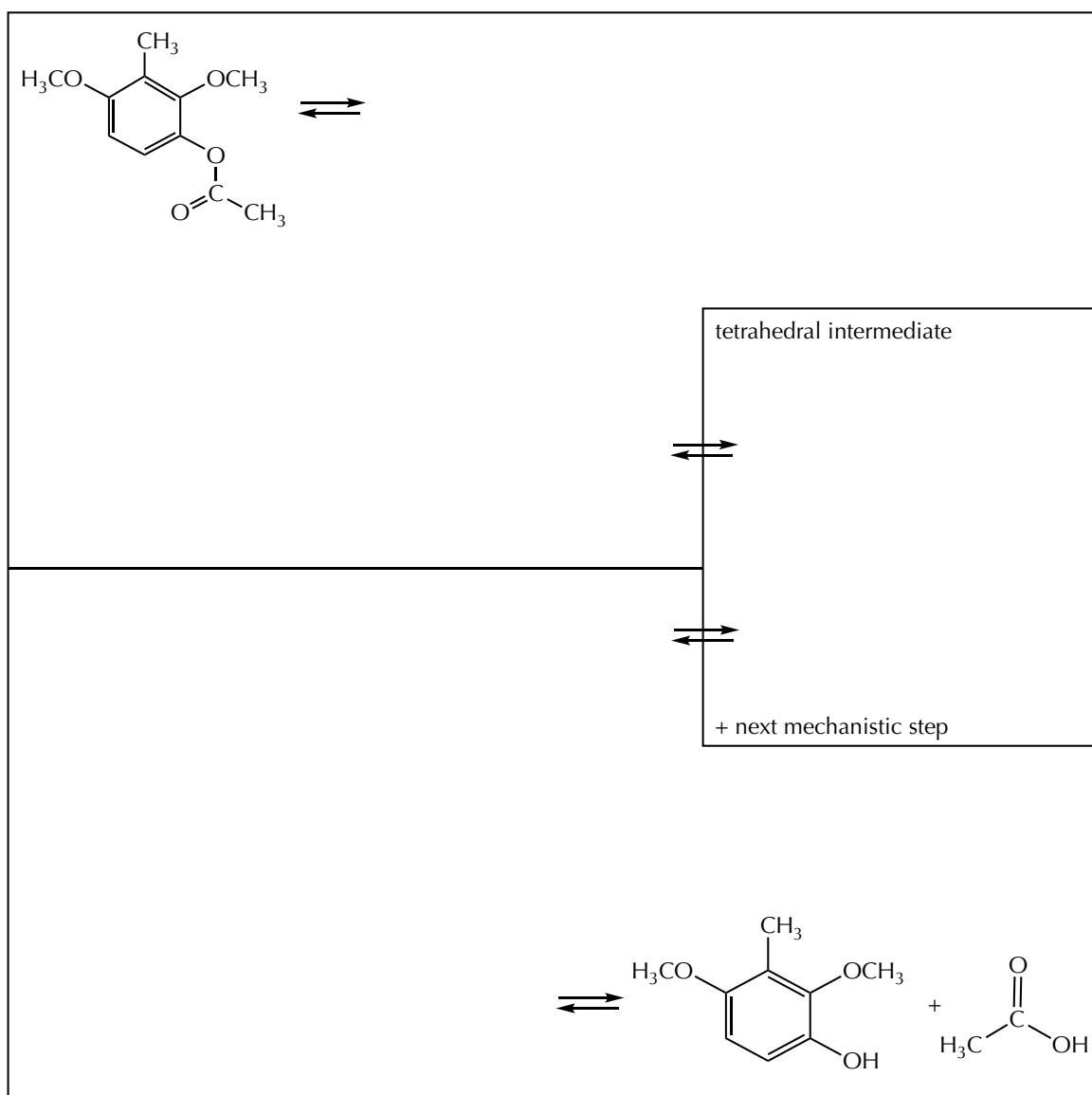


- 13.44 Provide the complete, stepwise mechanism for the acid-catalyzed hydrolysis reaction of the following ester to the corresponding acid and alcohol products. Provide explicitly the structure of the significant intermediate ("the tetrahedral intermediate") in the hydrolysis mechanism.

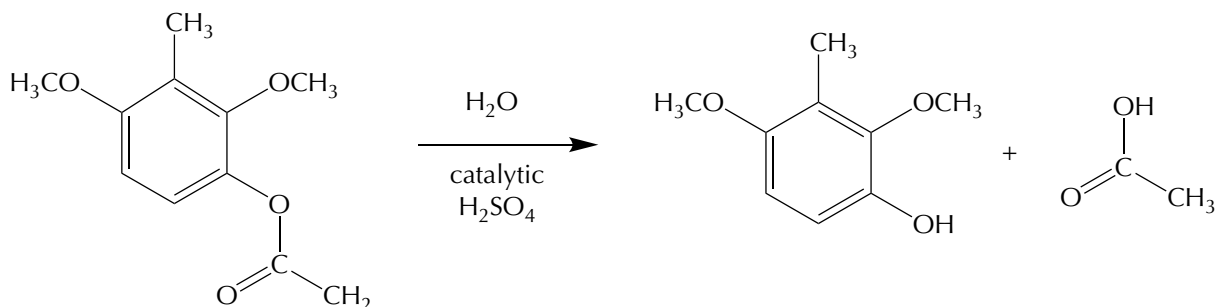


You may use H-B and B<sup>⊖</sup> for any general Brønsted acid or base, respectively, that you need.



**Chemistry 215 • Thinking in Blue • Week 06**

Provide the complete, stepwise mechanism for the acid-catalyzed hydrolysis reaction of the following ester to the corresponding acid and alcohol products. Provide explicitly the structure of the significant intermediate ("the tetrahedral intermediate") in the hydrolysis mechanism.



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Nearly all of the identification for this question is provided by the text of the question and the drawings of the structures: an acid-catalyzed acylation reaction of water (as the nucleophile) with an ester (as the acylating agents). There is a general solution to this question that is simply a template to apply to this specific case. The intermediate is something that ought to be able to be drawn (as the product from the addition step), regardless of the mechanism.

addition  
H<sub>2</sub>O

intermediate

tetrahedral intermediate

Getting this intermediate correct is a useful way to simplify the problem by taking advantage of the split format, which is meant to remind you of the two main parts of the mechanism: addition followed by elimination.

At the next level of detail, the acid-catalyzed addition mechanism followed by the E1 elimination is also something that, once understood, is meant to be applied to any appropriate specific case.

H-B

acid-catalyzed addition of H<sub>2</sub>O to C=O

as always, the curved arrows will just tell this story in more detail

HO OH

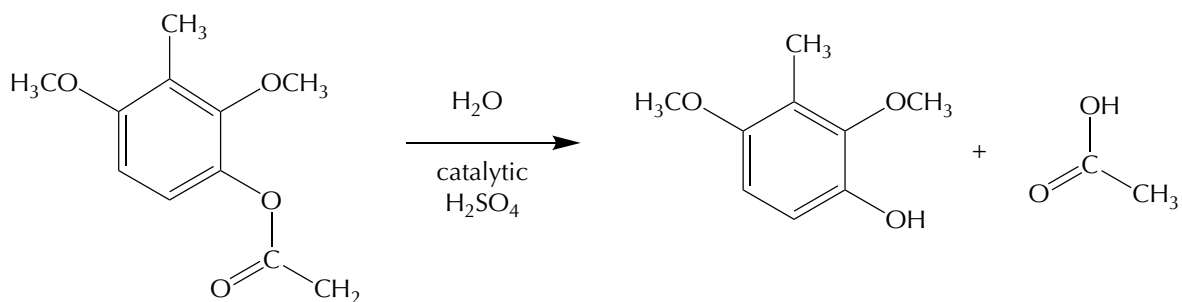
the tetrahedral intermediate

ROH

E1 elimination of ROH from the intermediate to give an acid

all of this information needs to be in mind when constructing the answer

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