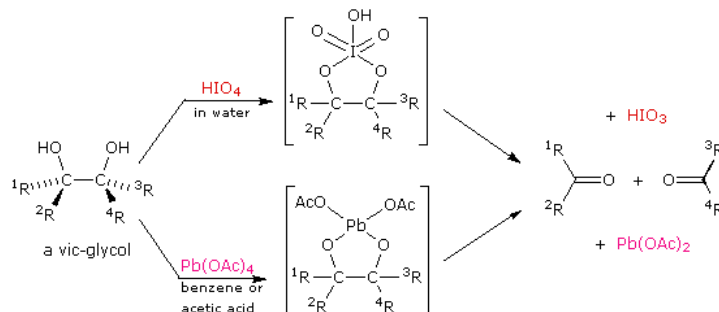


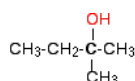
## 14.9: CLEAVAGE OF DIOLS

### GLYCOL CLEAVAGE

The vicinal glycols prepared by alkene hydroxylation (reaction with osmium tetroxide or permanganate) are cleaved to aldehydes and ketones in high yield by the action of **lead tetraacetate** ( $\text{Pb}(\text{OAc})_4$ ) or **periodic acid** ( $\text{HIO}_4$ ). This oxidative cleavage of a carbon-carbon single bond provides a two-step, high-yield alternative to ozonolysis, that is often preferred for small scale work involving precious compounds. A general equation for these oxidations is shown below. As a rule, cis-glycols react more rapidly than trans-glycols, and there is evidence for the intermediacy of heterocyclic intermediates (as shown), although their formation is not necessary for reaction to occur.



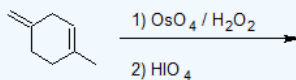
2-methylpropan-2-ol



2-methylbutan-2-ol

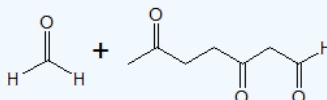
### Exercise

15. Predict the product of the reaction below.



Answer

15.



### CONTRIBUTORS AND ATTRIBUTIONS

- William Reusch, Professor Emeritus ([Michigan State U.](#)), [Virtual Textbook of Organic Chemistry](#)

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