1. Synthesis of Alcohols from Alkenes. Where possible, devise a selective synthesis for each of the isomeric alcohols shown below. For each compound, show the alkene you would use as a starting material and the reagents and reaction conditions you would employ to obtain the desired isomeric alcohol. If you cannot come up with a selective synthesis, suggest a synthesis that will produce the desired isomer as part of a mixture and show the other alcohols that would be part of the mixture.
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2. Write four resonance structures for the intermediate formed by addition of NO₂⁺ to anisole by putting in all π-bonds, lone pairs of electrons, and formal charges. CIRCLE the resonance structure that is needed to explain the selective formation of the para product. The nitration of anisole is ____ faster ____ slower than the nitration of benzene.
3. @

A

Most stable

B

Least stable

D

E

\[ \pm 10^\circ \leftrightarrow 3^\circ \]

E is more stable than D. E is an allylic cation with @ on a tertiary + primary carbon, while D has @ on a secondary + primary carbon. The more carbon substituted cations are more stable.
Protonation of isoprene occurs to give the most stable allylic cation E.

G + H are not found because the less stable allylic cation D is not formed.