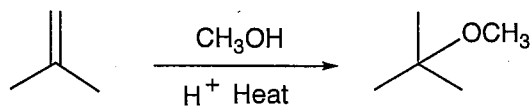


Bonus Question: (10 Points)

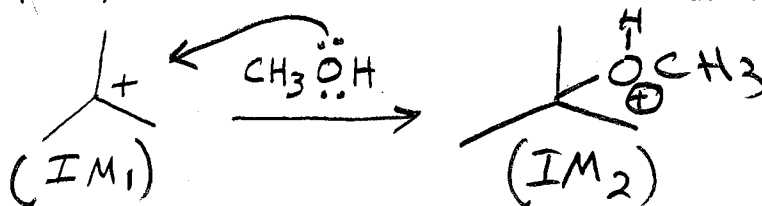
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Key

MTBE is a fuel additive for enhancing the octane number in gasoline. It is made in industry by reacting isobutene with methyl alcohol in presence of a mineral acid as below.



1. (5 points) Draw the structure of all reaction intermediates for the above reaction.



2. (5 Points) Provide an energy diagram for the above reaction, indicating the position of reactant, products, carbocation intermediate, energy of activations, transition states, enthalpy, and Gibbs free energy assuming an exothermic process.

