

# Exercise Session 8

## IESM Fall 2023-2024

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# Course Reminders

## Course Reminders:

- Exercises 8 and 9 will not have interviews and will have due date **31. January**
- Plus, we only keep the best grades of 8 of 9 reports : )
- Feel free to contact us via email or forum for questions about Ex8 and Ex9 !

## Exercise 8 Finding transition states

In this set of exercises, we will learn how to traverse the potential energy landscape in interesting directions toward transition states.

### 🎯 Learning goals

- Understand how to navigate the PES to transition states
- Visualize chemical reactions

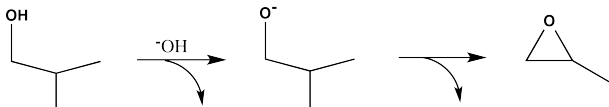
### 📖 Chapter in script

Not in script but of practical relevance

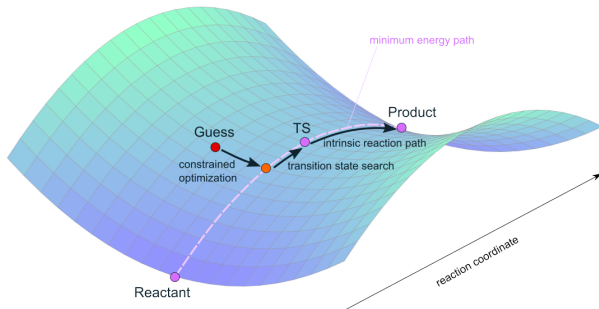
### 📚 Resources

Frank Jensen - Computational Chemistry  
Ch12.8 p.416ff

#Reaction Mechanisms & Stereochemistry \* The formation of propylene oxide takes place in a couple of steps \* Nucleophilic substitution occurs, binding O to C, and removing Cl<sup>-</sup> (leaving group) \* What is the name of such a mechanism and what is the orientation of O with respect to Cl as the ring begins to form? \* What might possible transition states look like as the ring begins to form?



# Intrinsic Reaction Path



# Tips

- You do not need to run all notebooks! We provide some data to you (we are the “colleague” in this case) while writing out the code if you’re interested.
- Read instructions carefully on how to generate a “guess” transition state
- Calculations may take time, please don’t be alarmed!
- Notebooks are named Ex 9 based on past ordering, but this is Ex 8