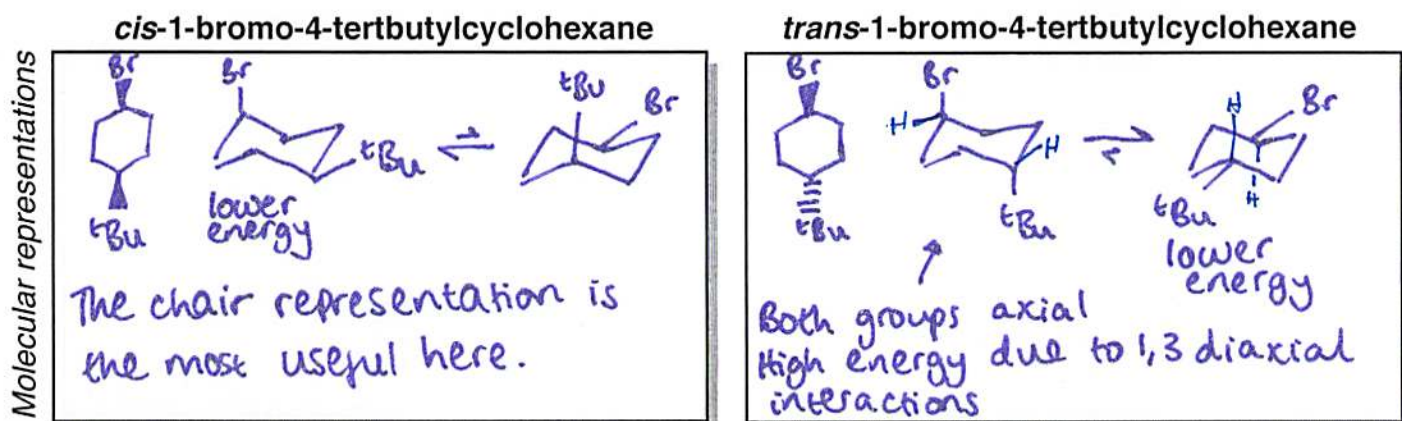


Does **cis-1-bromo-4-tertbutylcyclohexane** or **trans-1-bromo-4-tertbutylcyclohexane** undergo elimination more rapidly when treated with sodium ethoxide?

1. First draw the molecules (think about what kind of molecular representation is most useful here)



2. Determine which mechanism is taking place and draw the mechanism using curved arrows

Tick one box:

E1

☐

E2

☒

Tick one box:

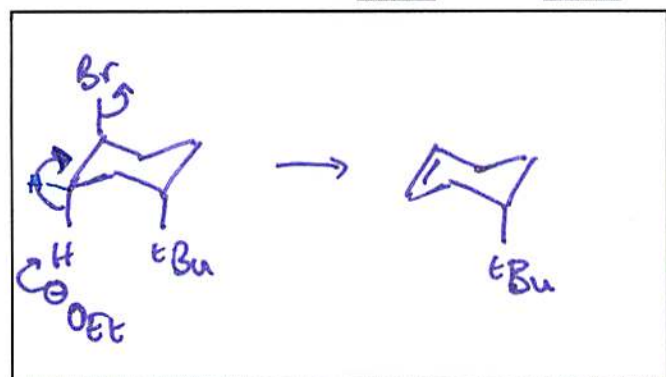
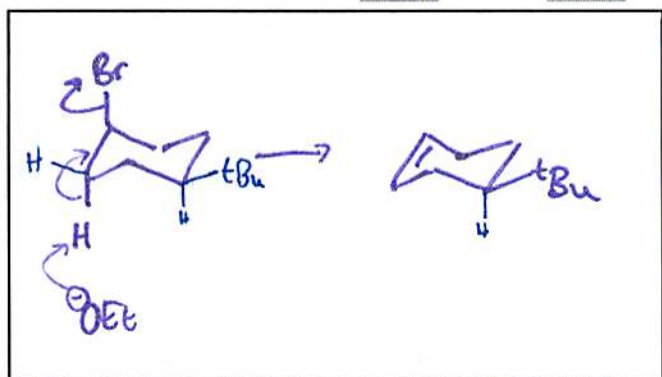
E1

☐

E2

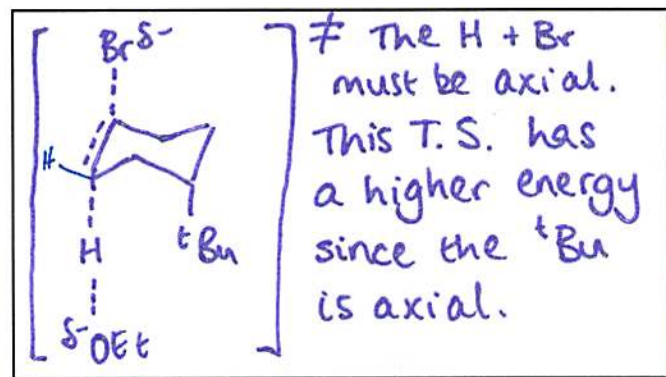
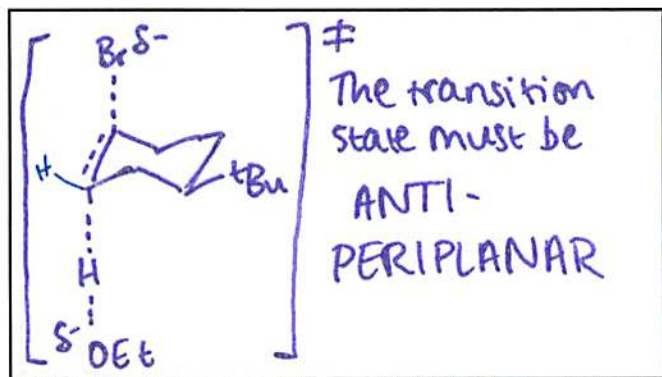
☒

Mechanism



3. Determine and draw the transition state of this mechanism

Transition State



4. Which one reacts faster? Briefly explain:

Tick one box:

☒

cis

☐

trans

E2 elimination requires the Br to be axial. For the trans isomer, this conformation has very high energy due to the 1,3 diaxial interaction between tBu and H. Thus the activation energy is high. For the cis isomer, the activation energy is lower since the tBu is equatorial. Thus the reaction is faster.