*CHEM 242 – Lecture 10 29/01/2014*

Overheads: - Outline

Quiz #2

Recap Monday: Stereochemistry of E2



Cyclohexanes: H & LG must both be axial to be anti



Summary of 4 Reactions

|  |  |  |  |
| --- | --- | --- | --- |
| SN1 | SN2 | E1 | E2 |
| 3° R-Br | 1° R-Br | 3° R-Br | ALL R-Br |
| 2° R-Br / allylic | 2° R-Br / allylic | 2° R-Br / allylic |  |
|  |  |  |  |
| weak Nu- ok | strong Nu- needed | weak base ok | strong base (≥OH-) |
| protic solvent | aprotic solvent | protic solvent | aprotic solvent |
|  |  | Elimination needs -H  (E1 can rearrange first though) | |

Stereochemistry:

|  |  |  |  |
| --- | --- | --- | --- |
| racemic | inversion | trans>cis | ANTI elimination |

Competition Between the 4 Reactions:



Ask 2 Questions:

1) Is a C+ likely formed?

- 1° R-LG ⇨ NO

- 3° ⇨ YES 🡪 unless strong base: E2 likely

- 2° / allylic ⇨ MAYBE! 🡪 solvent: protic = C+ aprotic = no C+

🡪 base/Nu-: weak = C+ strong = no C+

2) Substitution or Elimination? (Elim needs -H)

a) SN1 *vs* E1 (if C+)

- both need weak base / Nu- (same! ⇨ not in RDS!) *e.g.* Cl-, H2O

- E1 helped by NaHCO3, Na2CO3 (weak bases, not good Nu-)

⇨ generally both compete ☹

b) SN2 *vs* E2 (if no C+)



- good Nu- *vs* strong base (OH- or better) (not always same thing!)



(pKa ≥ 15)

