SN1 & SN2 REACTIONS

Project work submitted to

Vikrama Simhapuri University, Nellore

In partial fulfilment for the award of the degree of

Bachelor of science In

Chemistry

By,

B.Neeraja

Research supervisor

Smt B Krupa Karuna Vani , Lecturer in Chemistry

DEPARTMENT OF CHEMISTRY

SKR GOVERNMENT DEGREE COLLEGE, GUDUR-524101,

TIRUPATI (Dist.),ANDHRAPRADESH, INDIA.

DECLARATION

I, **B.Neeraja,** B.Sc.,(Second year), Department of Chemistry SKR Government Degree College, Gudur, A.P, do hereby declare that Project work entitled **SN1 & SN2 REACTIONS** is carried by me under the guidance of Smt **B Krupa Karuna Vani,** lecturer in Chemistry, SKR College, Gudur, A.P. This work is original and has not been submitted for any other degree or diploma.

Place: *Gudur*

B. Neeraja.

Date :

Smt B Krupa Karuna Vani
Lecturer in Chemistry
SKR Government College
Gudur-524101,Tirupati District

Mail : bkkvani98@gmail.com
Phone : 8184835219

CERTIFICATE

This is to certify that the project work entitled **SN1 & SN2 REACTIONS** submitted to **Vikrama Simphapuri university** is bonfire record of research work carried out by **B.NEERAJA** for the award of **B.Sc., degree** in record of original research work done by him during the period of his study 2021-2022 under my supervision in the Department of Chemistry **SKR government degree college,Gudur** and has not been submitted in part or full for award of any degree/diploma /associate ship /fellowship /any other similar title.

Place : Gudur
Date :

BKkvani

{BKK Vani}
Research Supervisor

EFERENCES

L. G. Wade, Jr., Organic Chemistry, 6th ed., Pearson/Prentice Hall, Upper Saddle Rive New Jersey, USA, 2005

Peters, K. S. (2007). "Nature of Dynamic Processes Associated with the SN1 Reactio Mechanism". Chem. Rev.

Lowry, Thomas H. (1987). Mechanism and theory in organic chemistry. Richardson, Kathleen Schueller. (3rd ed.). New York: Harper & Row

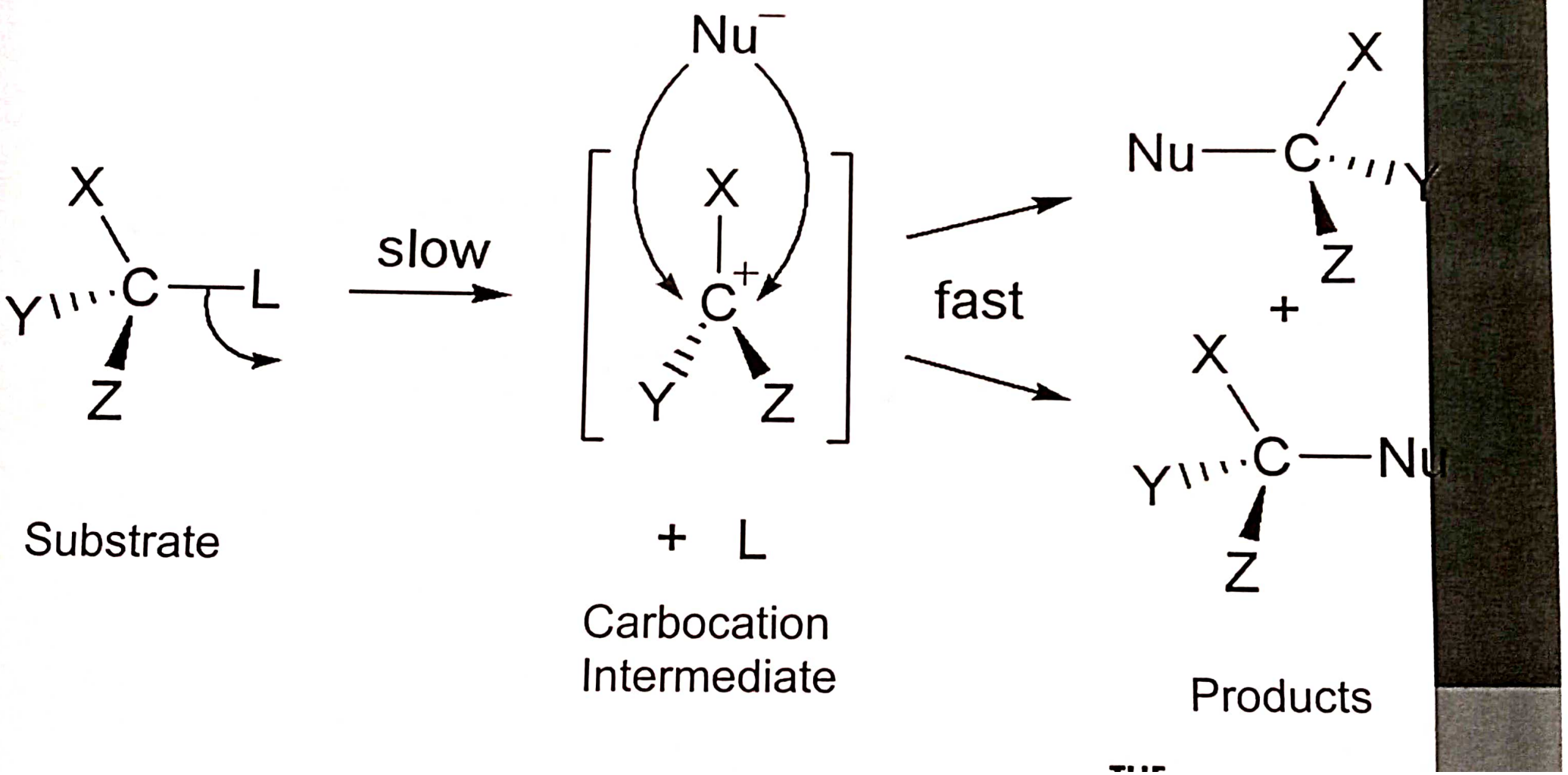
Sorrell, Thomas N. "Organic Chemistry, 2nd Edition" University Science Books, 2006

Clayden, Jonathan; Greeves, Nick; Warren, Stuart (2012). Organic chemistry (2nd ed Oxford: Oxford University Press

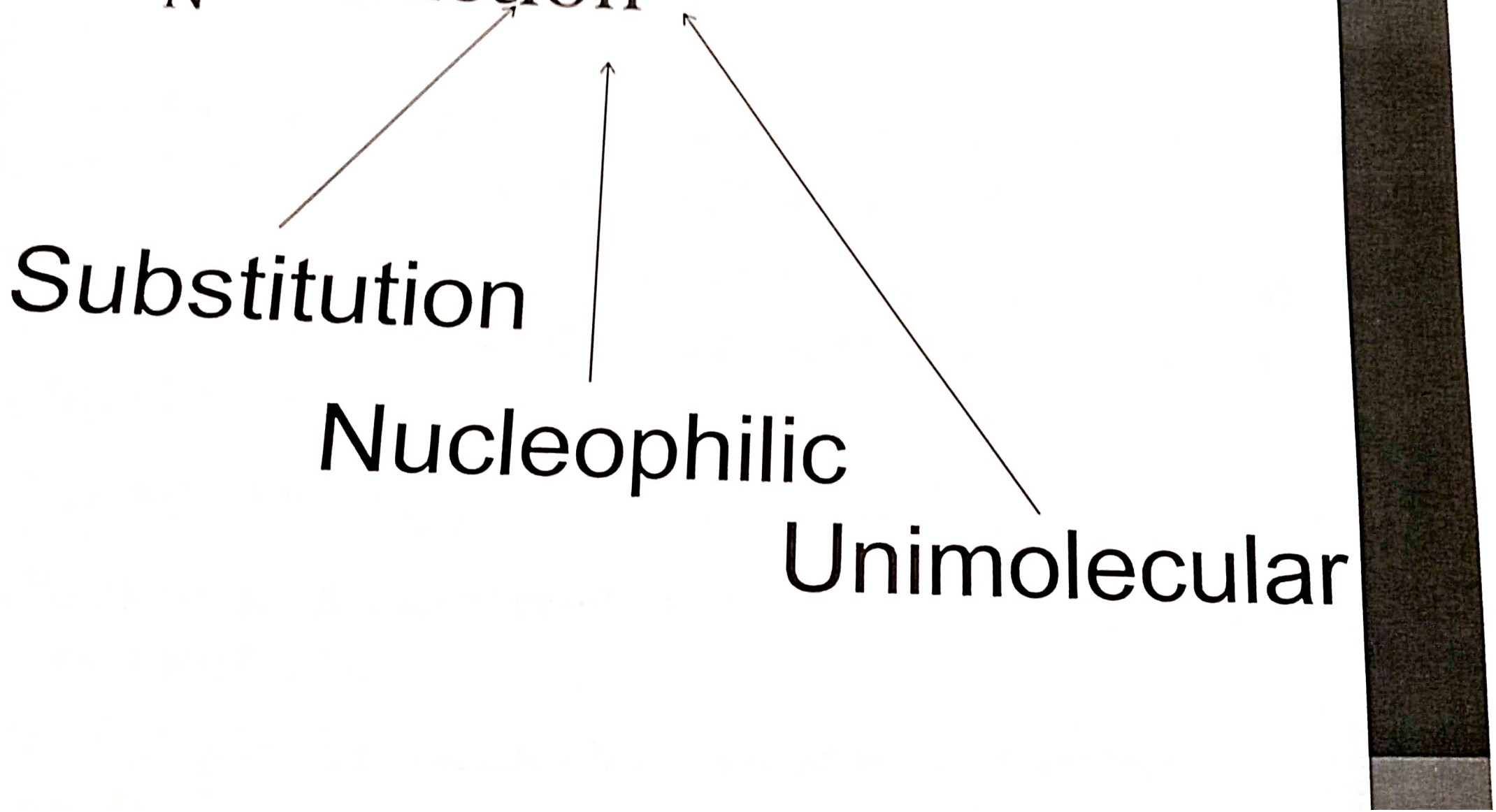
Hansen, Thomas; Roozee, Jasper C.; Bickelhaupt, F. Matthias; Hamlin, Trevor A. (4 February 2022). "How Solvation Influences the S N 2 versus E2 Competition"

Smith, Michael B.; March, Jerry (2007), Advanced Organic Chemistry: Reactions, Mechanisms, and Structure (6th ed.), New York: Wiley-Interscience

The S_N1 Reaction



The S_N1 Reaction



The S_N1 Reaction

SN1 reactions are nucleophilic substitutions, involving a nucleophile replacing a leaving group (just like SN2).

However: SN1 reactions are **unimolecular:** the rate of this reaction depends only on the concentration of *one reactant.*

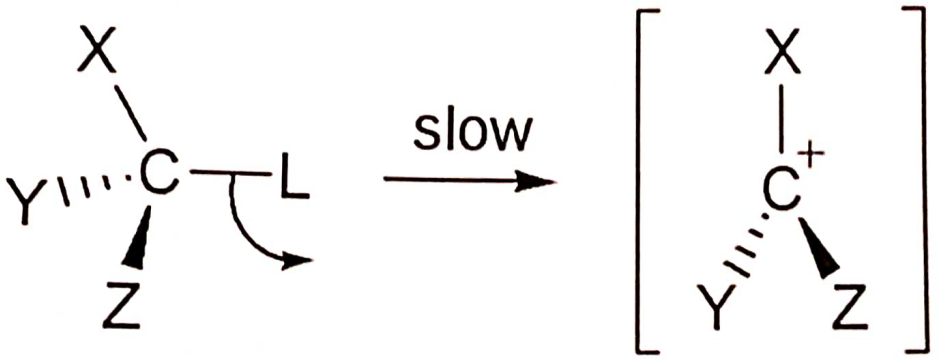
SN1 reactions happen in two steps:

1. The leaving group leaves, and the substrate forms a *carbocation intermediate*.
2. The nucleophile attacks the carbocation, forming the product.

THE

The S_N1 Reaction

1. The Slow Step:



First step of the SN1 reaction:

The leaving group leaves, and the substrate carbon now only has thre

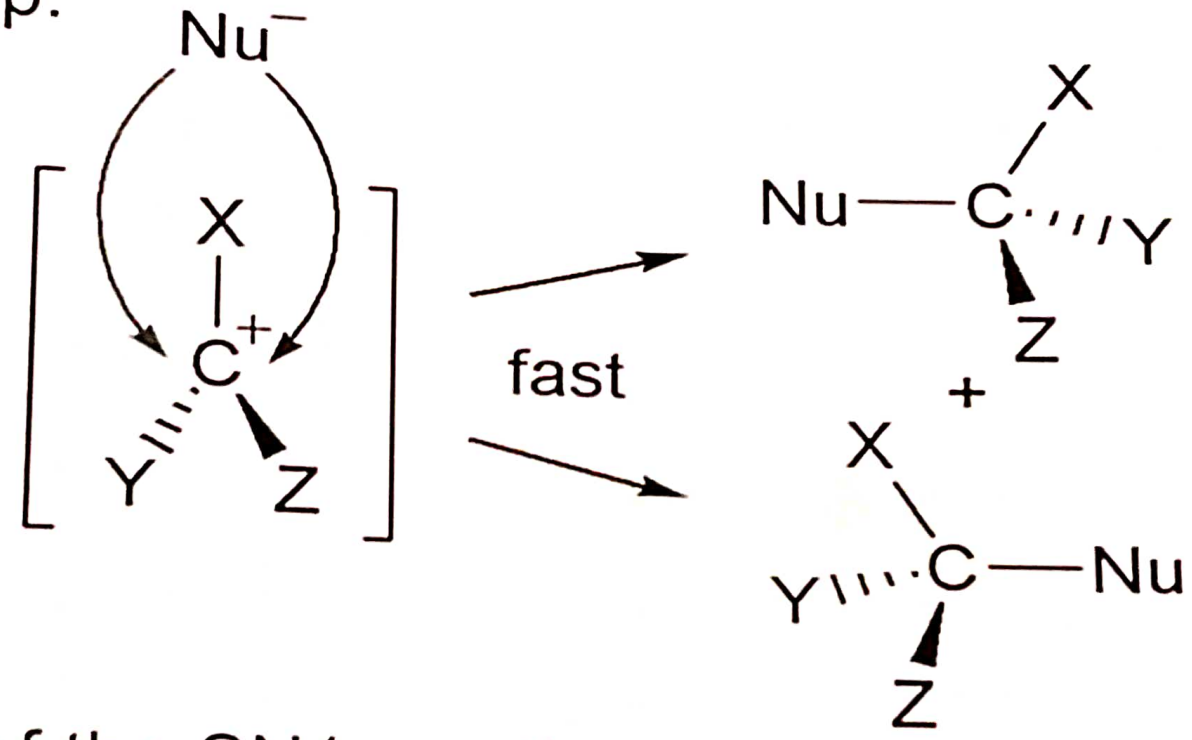
- Carbocations are most stable when there are more atoms to distribut
- Carbocation stability:

$$3^o > 2^o >> 1^o$$

- Tip: study the difference between reaction intermediates and transition state

The S_N1 Reaction

2. The Fast Step:



Second step of the SN1 reaction:

The nucleophile attacks the carbocation intermediate, bringing

•The substrate loses any stereospecificity during the carbocatio

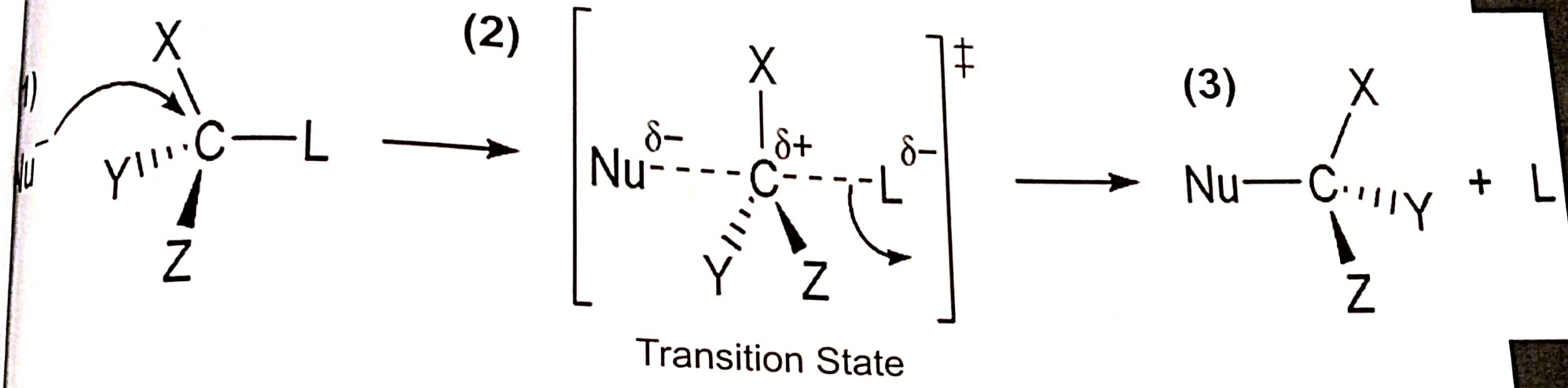
The S_N2 Reaction

Bimolecular: A *bi*molecular reaction is one whose rate depends on the concentrations of *two* of its reactants.

SN2 reactions happen in one step – the nucleophile attacks the substrate as the leaving group leaves the substrate.

Tip: Recall that the rate of a reaction depends on the slowest step. In bimolecular reactions, therefore, the slow step involves two reactants. For SN2 reactions, there are only two reactants; this means that the slow step is the *only* step.

The S_N2 Reaction



Transition State

SN2 summary:

(1) Nucleophile back-side attacks the δ+ carbon center.

(2) Transition state forms in which nucleophile is forming bo

(3) The leaving group leaves, forming the final product.

The S_N2 Reaction

Notes:

- *In* the SN2 reaction, the nucleophile attacks from the most δ+ r
- *This* back-side attack causes an *inversion* (study the previous
- The nucleophile must be able to reach the δ+ carbon center th

- *Tip:* see chapter 6 of your textbook to learn what makes a good nucleop