

# Cheatography

## Organic Chemistry Exam 2 Cheat Sheet

by Shelbeans (shelbeans) via [cheatography.com/shelbeans/cs/37568/](https://cheatography.com/shelbeans/cs/37568/)

### Terms to know

Markovnikov's rule

in **addition reactions**, the proton is added to the carbon atom with the **greatest** number of hydrogen atoms attached to it

anti-Markovnikov's rule

in **addition reactions**, the proton is added to the carbon atom with the **lowest** number of hydrogen atoms attached to it

zaitsev's rule

in **elimination reactions**, the major product is the **more stable** alkene with the **highly substituted** double bond

### M, Anti-M and V

[link text](#)

### Elimination Reactions

E1

multistep,

E2

single step,

### Terms

Protic

Solvents with O-H or N-H bonds and the ability to hydrogen bond

Aprotic

Solvents that dont

Nucleophile

A simple metal and salt, nucleus "loving", usually anions

Electrophile

Must contain a C-LG bond, electron "loving", usually cations

Solvolytic Reaction

the nucleophile is also the solvent



By **Shelbeans** (shelbeans)  
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### Terms (cont)

E/Z System

1. Prioritize the 2 groups attached to each carbon relative to one another. If the higher priority groups are **cis**, its **Z**, if their **trans**, its **E**

### Terms

Vicinal

2 atoms or groups bonded to same carbon

Geminal

2 atoms or groups beonged to the same side of the carbon

syn-addition

added to same plane or same side of compound

anti-addition

added to different sides of compounds

### Geminal vs Vicinal

[link text](#)

### Anti vs Syn

[link text](#)

### Substitution Reactions

SN1

2 step, RR possible, tertiary reacts fastest

SN2

1 step, no RR, Primary reacts fastest

### Elimination and Substitution Flowchart

[link text](#)

### Addition Reactions

Names of Reaction	Kind of Reactant	Whats on Arrow	Product structure
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Page 1 of 1.

### Addition Reactions (cont)

Catalytic Hydrogen-	Alkene	H <sub>2</sub> , Ni, Pt	alkane, N or Pd
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Addition of hydrogen halides	Alkene	H-X	M, No syn/anti, I
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Acid Catalyzed hydration	Alkene	H <sub>2</sub> SO <sub>4</sub> or H <sub>+</sub> , H <sub>2</sub> O	New H ar M, no syn/anti, I
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Hydrob-oration-O- xidation	Alkene	1. B3H6, 2. H <sub>2</sub> O, -OH	New H ar OH added Anti-M, S no RR
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Addition of Halogens/- haloge- nation	Alkene	X <sub>2</sub> , CH <sub>3</sub> Cl	new vicin halogens not applic able, Anti No RR
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Cohalo- genation	Alkene	Br <sub>2</sub> , H <sub>2</sub> O	new halogen a OH, M of OH and Anti-M for halogen, Anti, No F
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Expoxi- dation	Alkene	RCOO- OH (peroxide)	Expodie i formed, N not applic able, Syn No RR
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Ozonolysis	Alkene	1. O <sub>3</sub> , 2. H <sub>2</sub> O	2 carbonyl compoun nothing e applicable
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M=Markovnikov's Rule

Anti-M= Anti-Markovnikov's Rule

RR=Rearrangement

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