CONCEPT: CATALYSIS

●Recall: Enzymes can lower _____ in *several* ways but the common theme is to _____ the *transition state*.

□ Question: What are the different types of enzyme catalysis mechanisms?

□ Enzyme catalysis is primarily conducted via _____ mechanisms:

1) _____-_____ catalysis. 2) _____ catalysis. 3) _____ ion catalysis. 4) _____ catalysis.

PRACTICE: What is the common strategy for which enzyme catalysis occurs?

a) Increasing the probability of product formation.
b) Shifting the reaction equilibrium.
c) Stabilization of the transition state.
d) a and c are correct.

1) General Acid-Base Catalysis

●Acid-Base Catalysis: when an _____ or *base* catalyzes a reaction via a _____ (H^+) transfer.

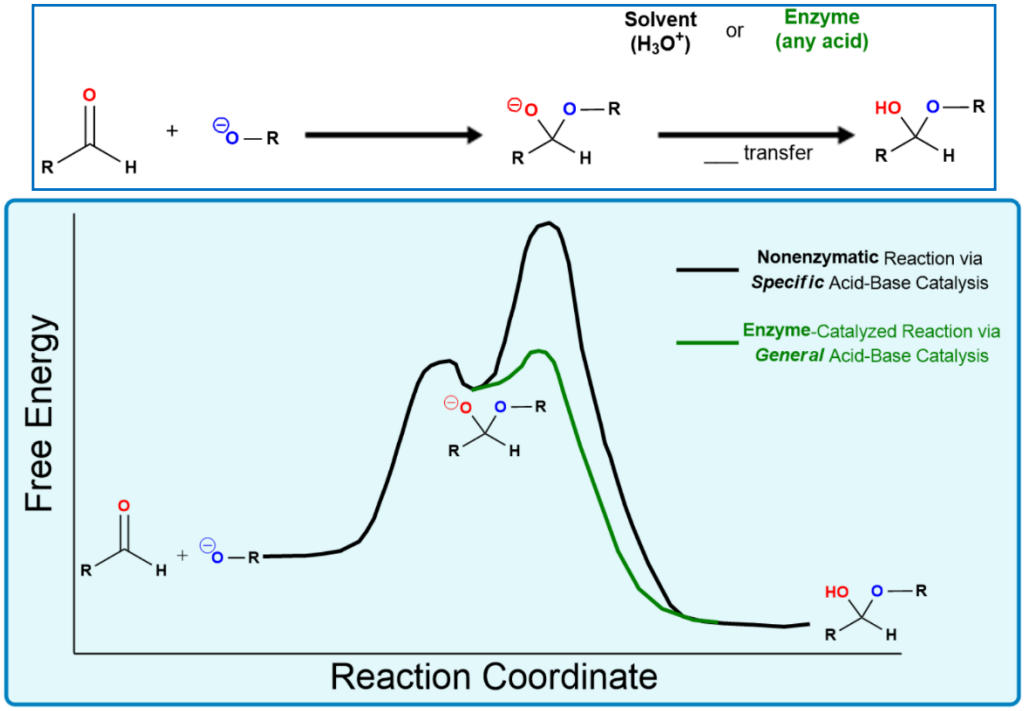
□ Unstable charged _____ can be stabilized with H^+ transfers.

●_____ main types of acid-base catalysis:

□ *Specific* Acid-Base Catalysis: *only* solvent (H_2O) serves as a H^+ transfer source; sometimes this is too _____.

□ _____ *Acid-Base Catalysis*: the _____ active site *mediates* H^+ transfers via *any* acid/base.

EXAMPLE: Specific vs. General Acid-Base Catalysis.



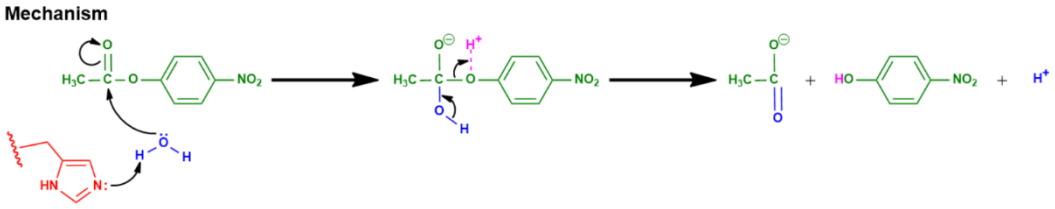
PRACTICE: Which of the following could not be the direct H^+ transfer source for general acid-base catalysis?

a) Lysine. b) Glutamic acid. c) Water. d) Tyrosine. e) Phenylalanine.

CONCEPT: CATALYSIS

PRACTICE: The catalytic mechanism below is an example of:

a) General acid catalysis.
b) Specific acid catalysis.
c) General base catalysis.
d) Specific base catalysis.



PRACTICE: Which of the following best applies to general acid-base catalysis?

a) A proton is transferred between the enzyme and substrate.
b) Uses nucleophilic functional groups.
c) May take part in interactions involving Fe^{2+}.
d) Catalyst retains its original form after reaction occurs.
e) Other than losing/gaining a H^+, the catalyst retains its original form.
f) a & d.
g) a & e.