

Clicker quizzes will be important in organic chemistry.

A good performance on clicker quizzes can earn you points toward your final grade.

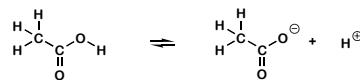


a clicker

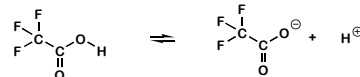
Clicker quizzes	60	} All exams will be based upon the class quizzes, workshops and assigned problems
Workshops	60	
Midterms	300	
Final	180	
Total	600	

Review: Acetic acid has a larger K_a than trifluoroacetic acid. True or False?

- A. Very sure this is true D. Maybe this is false
 B. Somewhat sure this is true E. Somewhat sure this is false
 C. Maybe this is true F. Very sure this is false



acetic acid

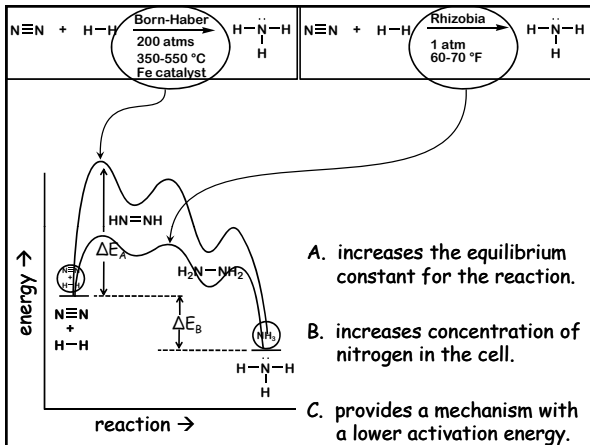


trifluoroacetic acid

A question from the gen chem final exam:

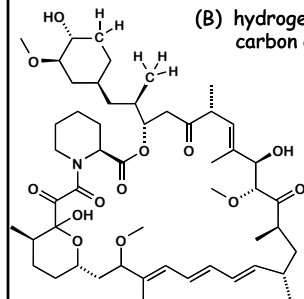
While high temperatures and pressures are needed to produce ammonia from nitrogen in the industrial Born-Haber process, rhizobia found in root nodules of legumes manage to produce ammonia from nitrogen at pressures around 1 atm and temperatures around 300 °K because the enzyme nitrogenase _____.

- A. increases the equilibrium constant for the reaction.
 B. increases concentration of nitrogen in the cell.
 C. provides a mechanism with a lower activation energy.



The chemical formula of a compound can be determined from its chemical structure.

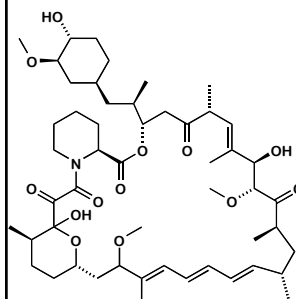
- (a) each node represents one carbon atom.
 (b) hydrogen atoms are added to each carbon atom until its valency is four.



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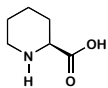
What is the formula of rapamycin?

- A. $\text{C}_{51}\text{H}_{79}$
 B. $\text{C}_{51}\text{H}_{79}\text{N}$
 C. $\text{C}_{51}\text{H}_{79}\text{NO}_{13}$
 D. $\text{C}_{51}\text{H}_{79}\text{NO}$



6

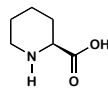
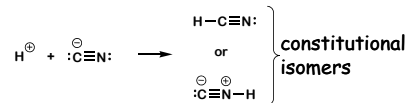
Pipercolic acid, an amino acid, is a substructure of rapamycin.



pipercolic acid

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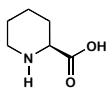
Constitutional isomers are structures with the *same* molecular formula but *different* connectivities.



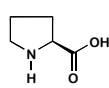
pipercolic acid

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Choose the structure(s) that is (are) constitutional isomers of pipercolic acid.



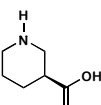
pipercolic acid



ii



iii



iv

A. i + ii

B. ii + iii

C. i + iii

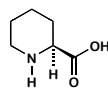
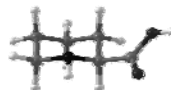
D. i

E. ii

F. iii

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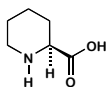
What does the wedges (\wedge) mean?



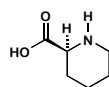
pipercolic acid

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The following two molecules are identical.



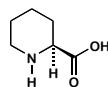
pipercolic acid



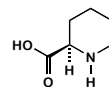
- A. true
B. false

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The following two molecules are identical.



pipercolic acid

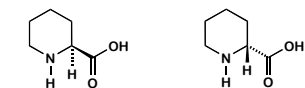


- A. true
B. false

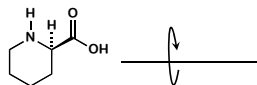
12

The following two molecules are identical.

- A. true
B. false

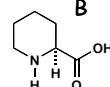
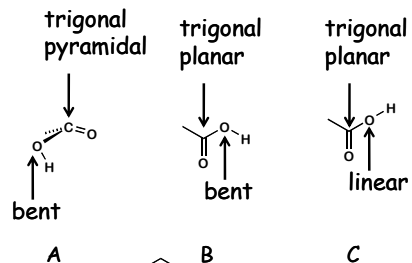


pipercolic acid



13

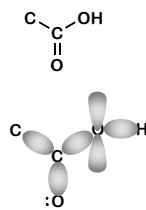
Predict the correct shape for the carboxyl group.



How do we predict the best molecular shapes?

Valence Shell Electron Pair Repulsion theory

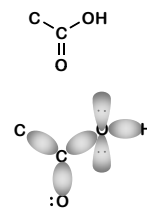
VSEPR: Electrons assume a geometry that minimizes their repulsion.



How do we predict the best molecular shapes?

Valence Shell Electron Pair Repulsion theory

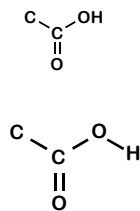
VSEPR: Electrons assume a geometry that minimizes their repulsion.



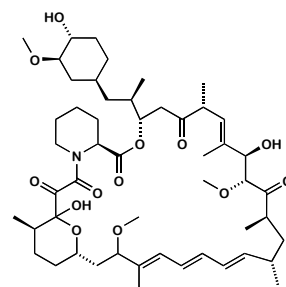
How do we predict the best molecular shapes?

Valence Shell Electron Pair Repulsion theory

VSEPR: Electron pairs assume a geometry that minimizes their repulsion.



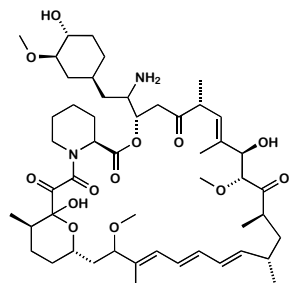
How do we predict the best molecular shapes?



rapamycin

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How do we predict the best molecular shapes?

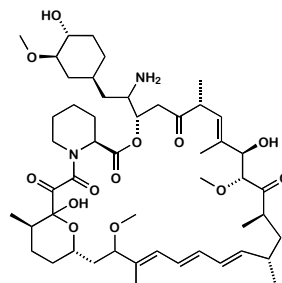


aminorapamycin

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Using VSEPR what shape would be predicted for the amino group in the following structure?

- A. trigonal planar B. trigonal pyramidal

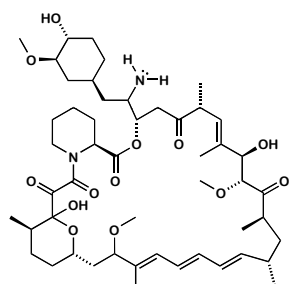


aminorapamycin

20

Using VSEPR what shape would be predicted for the amino group in the following structure?

- A. trigonal planar B. trigonal pyrimidal

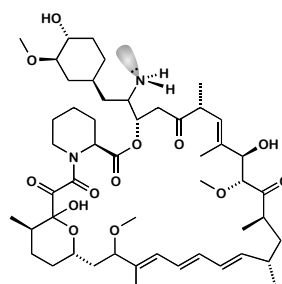


aminorapamycin

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Using VSEPR what shape would be predicted for the amino group in the following structure?

- A. trigonal planar B. trigonal pyrimidal

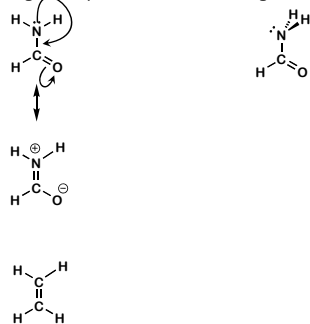


aminorapamycin

22

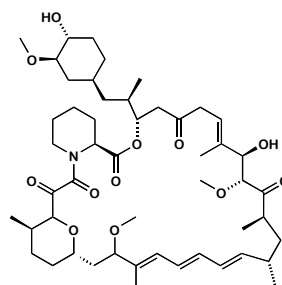
Using VSEPR what shape would be predicted for the amino group in the following structure?

- A. trigonal planar B. trigonal pyrimidal



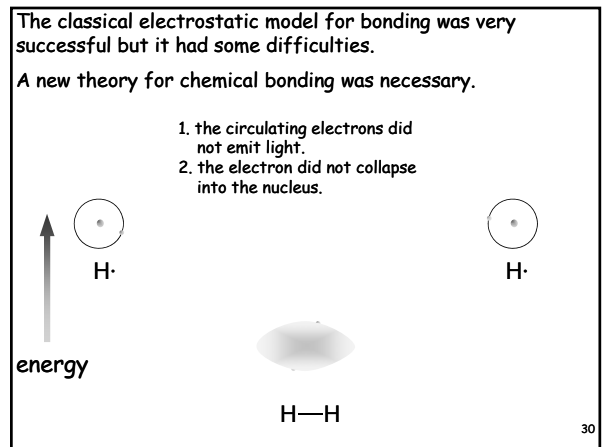
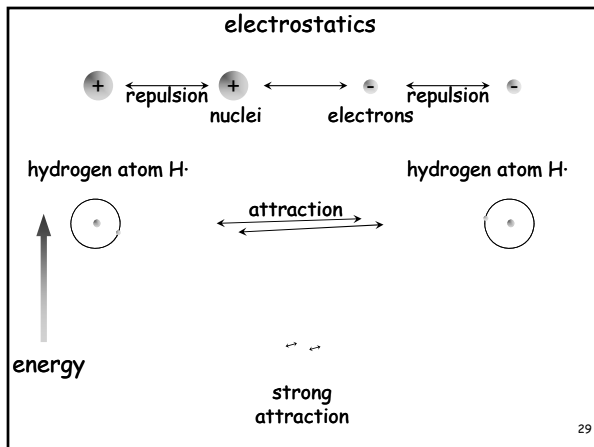
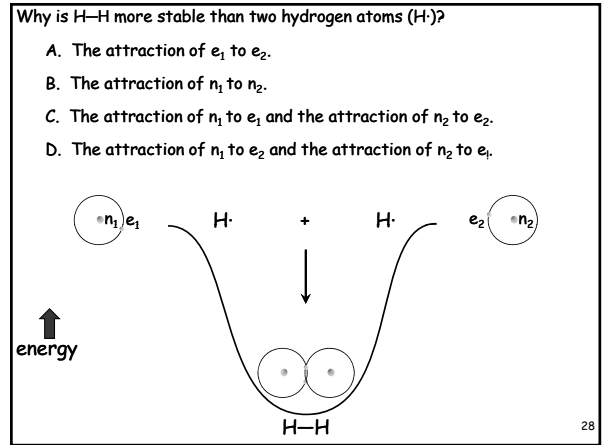
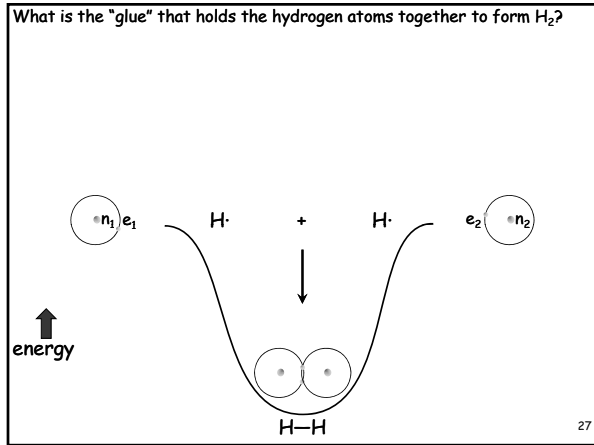
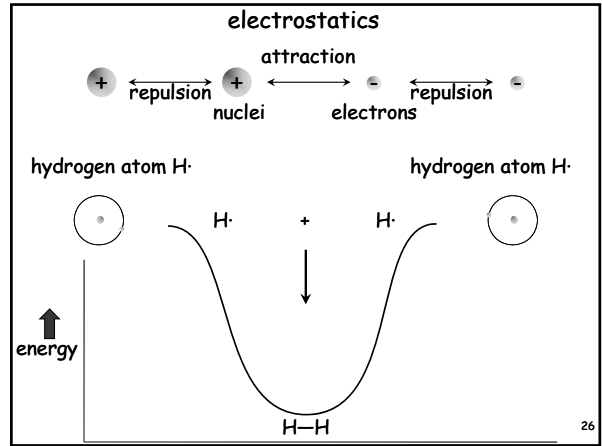
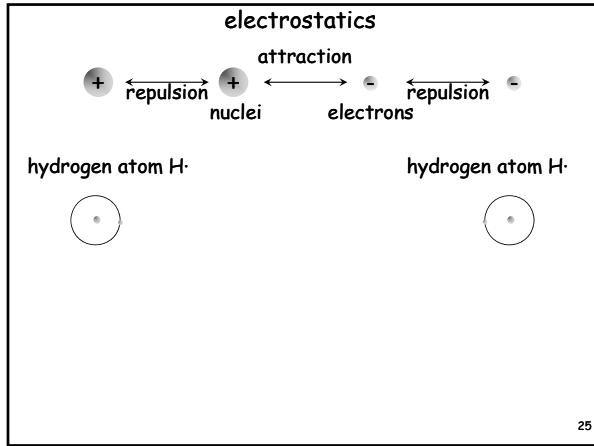
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What is the "molecular glue" that holds atoms together to give molecular structures such as rapamycin?



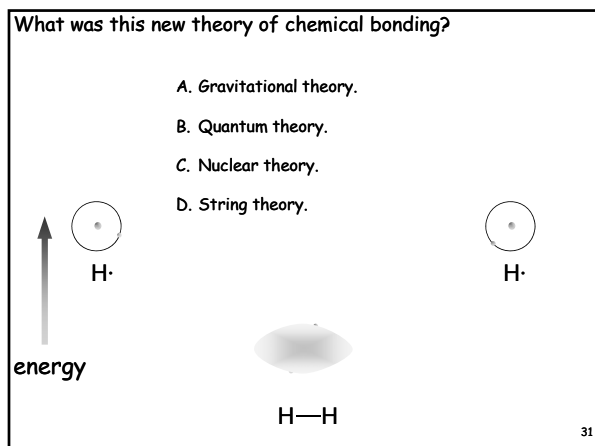
rapamycin

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What was this new theory of chemical bonding?

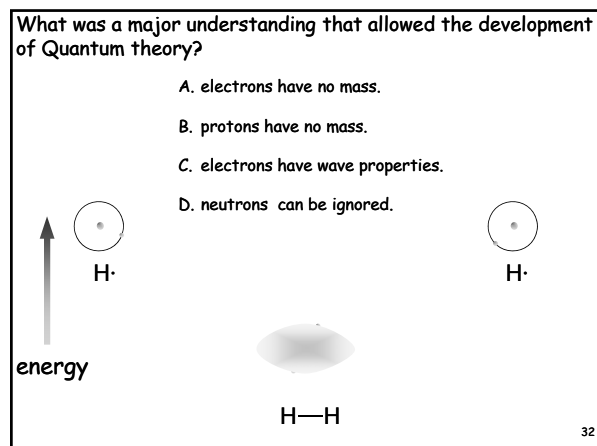
A. Gravitational theory.
B. Quantum theory.
C. Nuclear theory.
D. String theory.



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What was a major understanding that allowed the development of Quantum theory?

A. electrons have no mass.
B. protons have no mass.
C. electrons have wave properties.
D. neutrons can be ignored.



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