

Chemistry 333

Examination #1

February 28, 2005

Professor Charonnat

Name: _____

Be certain that your examination has four (4) pages including this one.

Put your name on **each** page of this examination booklet.

By putting your name on this examination booklet you agree to abide by California State University, Northridge policies of academic honesty and integrity.

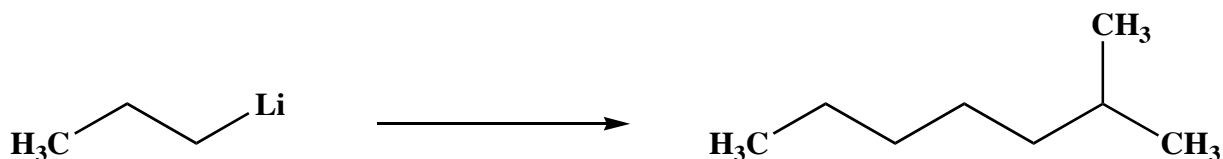
Molecular models are allowed for this examination. All electronic devices, including calculators, are unnecessary and are not allowed.

Name: _____

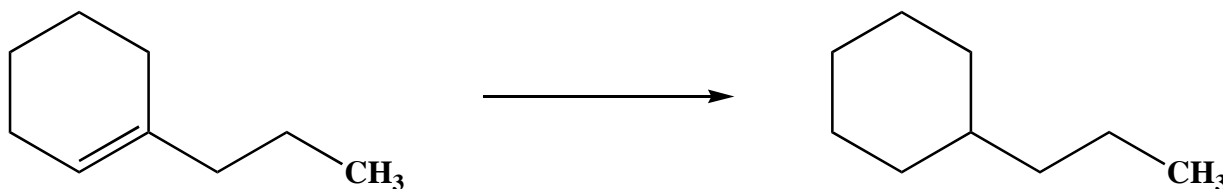
1. (20 points)

Draw the specific reagent(s) necessary to effect the following three (3) transformations. If more than one reaction is involved in an answer, be certain to distinguish the individual steps clearly.

A.



B.



C.



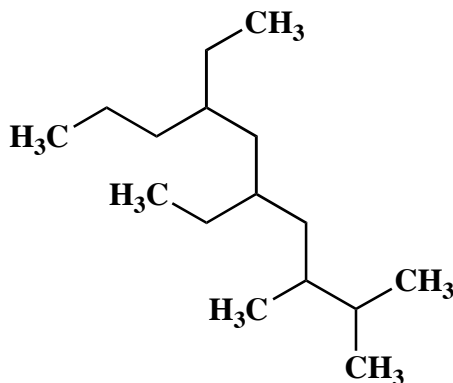
2. (10 points)

Draw a Newman projection of the least stable conformation of 2,3-dimethylbutane that is formed by rotation about the C2-C3 bond. Calculate the total strain energy for this conformation.

Name: _____

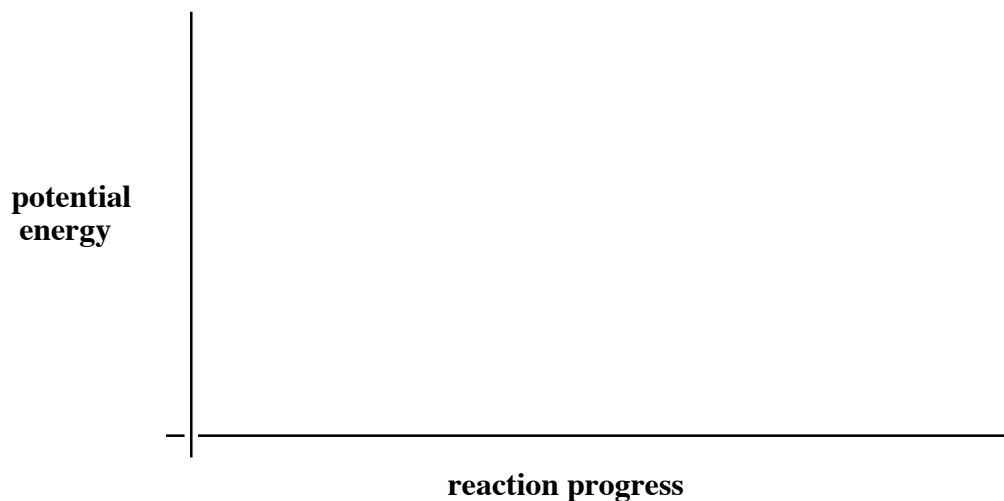
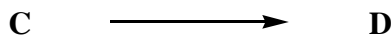
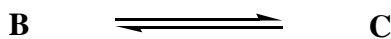
3. (10 points)

Use IUPAC nomenclature to write the systematic name of the following alkane.



4. (20 points)

Draw a reaction-energy diagram (graph of reaction progress versus potential energy) for the following, overall exothermic, three-step process. Label the curve with each of the following: starting material (sm), transition states (ts_x), intermediates (int_x), product (p), activation energies (E_{a_x}) and overall standard heat of reaction (ΔH°). Place a star next to the transition state of the rate-determining step. Finally, state which step has an early transition state, and which step has a late transition state.



early transition state:

late transition state:

Name: _____

5. (20 points)

A. Draw Lewis structures for both of the following two (2) compounds.

i. CHBr_3

ii. Li_2CO_3

B. What are the shapes of the two compounds above (linear, trigonal, tetrahedral, etc.)?

i. CHBr_3 _____

ii. Li_2CO_3 _____

6. (20 points)

Answer the following two (2) questions precisely, succinctly and with correct grammar.

A. Why does the photochemical chlorination of methane produce thousands of chloromethane molecules per photon of light?

B. Distinguish between a Lewis acid and a Lewis base. Draw a specific example of each class.

Congratulations!

1	/20
2	/10
3	/10
4	/20
5	/20
6	/20
Total:	/100