

Chem 220a

Problem Set 10

Chapters 12 and 14

Due: Monday, December 6, 2004

Material in this Problem Set will be covered in the final exam.

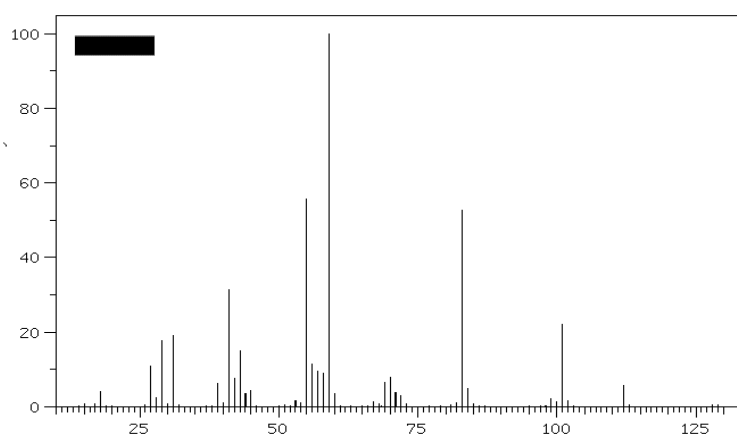
1. (30 pts) Treatment of compound **A** with catalytic $\text{HgSO}_4/\text{aq. H}_2\text{SO}_4$ gives two constitutional isomers **B** and **C**. Exposure of **B** and **C** independently to NaBH_4 affords compounds **D** and **E**, respectively. Hydrogenation of **A** provides n-octane.

a) What are the structures **A-E**?

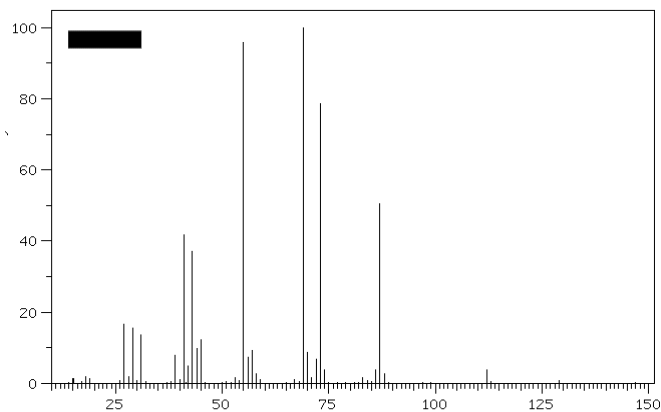
b) What is the molecular ion for **D** and **E** and is it visible in the spectra?

[For larger versions of the spectra, [click here.](#)]

Compound D



Compound E



2. (10 pts) (S)-Epichlorohydrin is treated successively with methyl magnesium bromide and isopropyl magnesium bromide to form chiral compound **A**. What is the structure of **A** and its absolute configuration? Explain and illustrate with a mechanism.

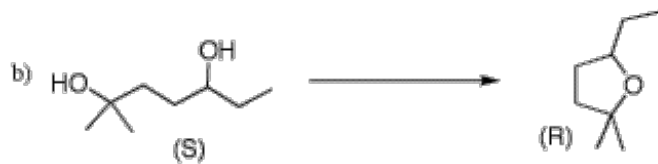
3. The data to the right represent the fragmentation patterns of two acyclic alkanes. What are their structures? Explain and illustrate? How many compounds are eligible for consideration? Which one is eliminated? Estimate the intensity

Alkane 1		Alkane 2	
m/z	intensity	m/z	intensity
15	2	26	1
26	3	27	22
27	43	28	3
28	5	29	20

of $M+1=73$.

30	1	39	12
37	1	40	2
38	3	41	50
39	30	42	78
40	5	43	100
41	88	44	4
42	95	53	1
43	100	55	4
44	6	56	3
50	2	57	20
51	2	72	17
53	3		
55	10		
56	40		
57	94		
58	5		
71	4		
72	16		

4. (40 pts) Provide the missing information in each of the following reactions. Provide explanations and mechanisms. For 4d, see pg. 621.





5. (50 pts) Provide the structures of **A-Z**. Show your reasoning where it is called for. Be brief.

