

Key

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Name above this line

First Letter of Last Name  K
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Although this room is crowded, do your best not share answers or information. **No notes, books, calculators, cell phones, iPods, computers or electronics of any sort allowed. Please turn off the ringer on your phone now.**

Put an X where you are sitting.

front

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page	marks	
3	13	
4	16	
5	16	
6	16	
<b>Total</b>		
	<b>61</b>	

6	Atomic number
<b>C</b>	Symbol
12.011	Atomic mass

**PERIODIC TABLE OF THE ELEMENTS**

Atomic masses are based on <sup>12</sup>C. Atomic masses in parentheses are for the most stable isotope.

Groups																VIIIA																			
1A																2																			
1																He																			
H																4.00260																			
1.00079																																			
3		4														5		6		7		8		9		10									
Li		Be														B		C		N		O		F		Ne									
6.941		9.01218														10.81		12.011		14.0067		15.9994		18.998403		20.179									
11		12		IIIB		IVB		VB		VIB		VIIB		VIIIB		IB		IIB		13		14		15		16		17		18					
Na		Mg																		Al		Si		P		S		Cl		Ar					
22.98977		24.305																		26.98154		28.0855		30.97376		32.06		35.453		39.948					
19		20		21		22		23		24		25		26		27		28		29		30		31		32		33		34		35		36	
K		Ca		Sc		Ti		V		Cr		Mn		Fe		Co		Ni		Cu		Zn		Ga		Ge		As		Se		Br		Kr	
39.0963		40.08		44.9559		47.90		50.9415		51.996		54.9380		55.847		58.9332		58.70		63.546		65.38		69.72		72.59		74.9216		78.96		79.904		83.80	
37		38		39		40		41		42		43		44		45		46		47		48		49		50		51		52		53		54	
Rb		Sr		Y		Zr		Nb		Mo		Tc		Ru		Rh		Pd		Ag		Cd		In		Sn		Sb		Te		I		Xe	
85.4678		87.62		88.9059		91.22		92.9064		95.94		(98)		101.07		102.9055		106.4		107.868		112.41		114.82		118.69		121.75		127.60		126.9045		131.30	
55		56		57		72		73		74		75		76		77		78		79		80		81		82		83		84		85		86	
Cs		Ba		La		Hf		Ta		W		Re		Os		Ir		Pt		Au		Hg		Tl		Pb		Bi		Po		At		Rn	
132.9054		137.33		138.9055		178.49		180.9479		183.85		186.207		190.2		192.22		195.09		196.9665		200.59		204.37		207.2		208.9804		(209)		(210)		(222)	
87		88		89		104		105		106																									
Fr		Ra		Ac		Unq		Unp		Unh																									
(223)		226.0254		227.0278		(261)		(262)		(263)																									

\*Lanthanide series

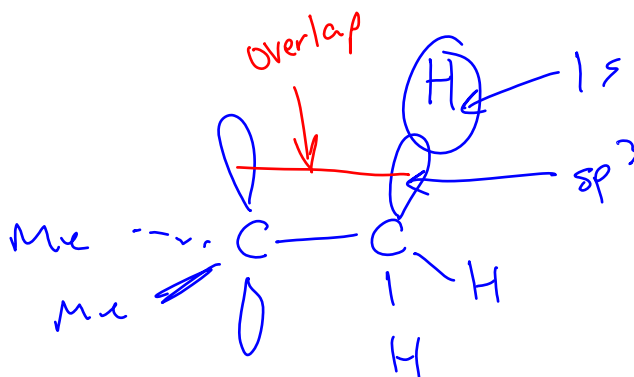
58	59	60	61	62	63	64	65	66	67	68	69	70	71
Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
140.12	140.9077	144.24	(145)	150.4	151.96	157.25	158.9254	162.50	164.9304	167.26	168.9342	173.04	174.967

† Actinide series

90	91	92	93	94	95	96	97	98	99	100	101	102	103
Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr
232.0381	231.0359	238.029	237.0482	(244)	(243)	(247)	(247)	(251)	(252)	(257)	(258)	(259)	(260)

2. A <sup>tertiary</sup> secondary carbocation is more stable than a <sup>secondary</sup> tertiary carbocation because of: hyperconjugation

3. Draw a diagram like those in class that illustrates the above concept.

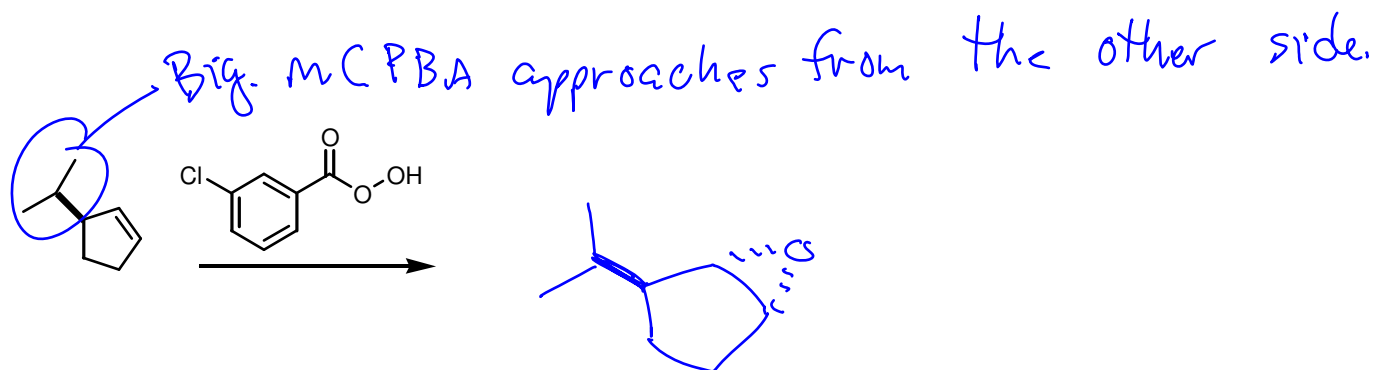
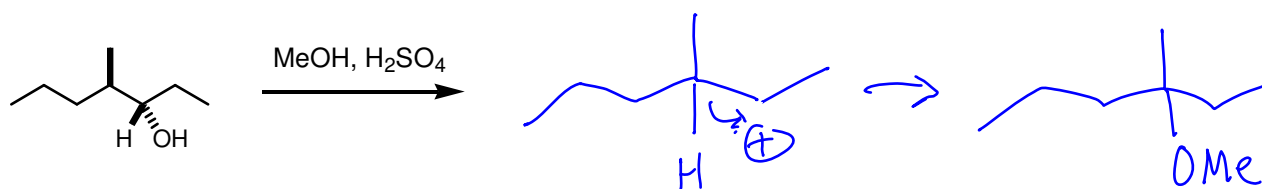
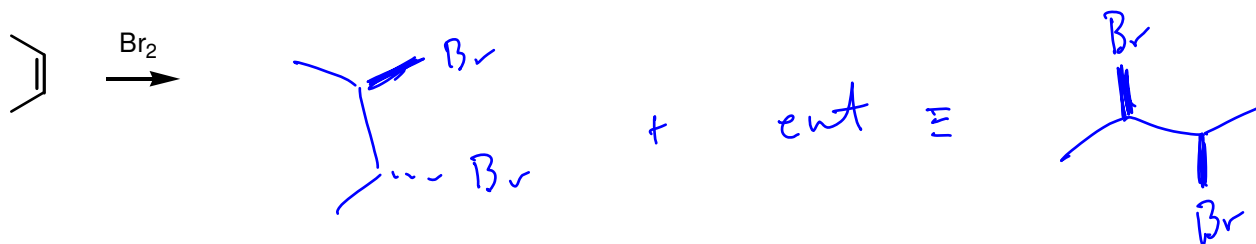


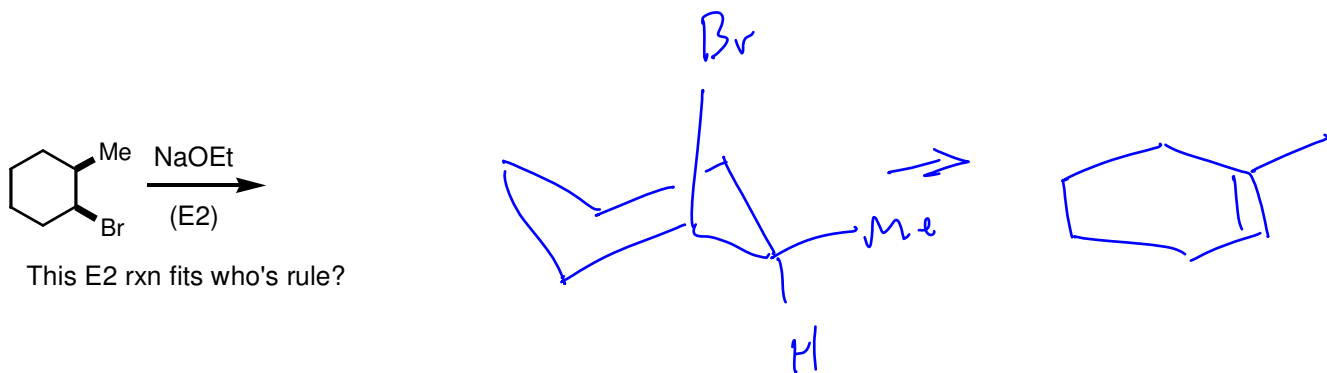
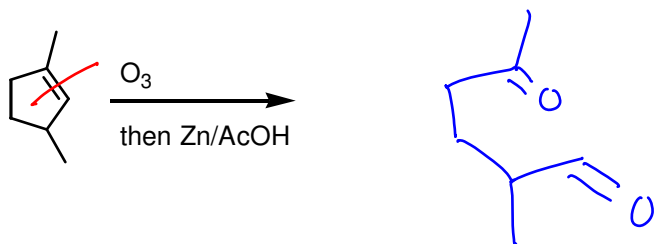
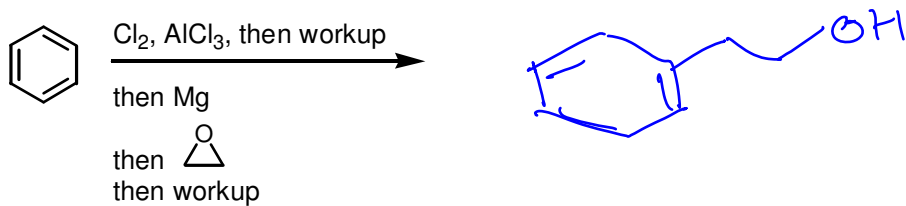
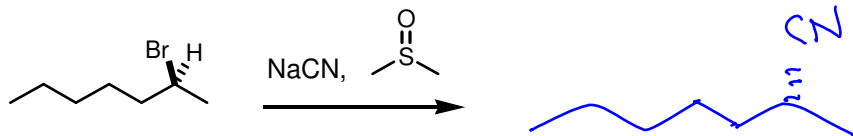
2. Explain why a polar protic solvent is better for SN1 reactions with alkyl halides than a polar non-protic solvent.

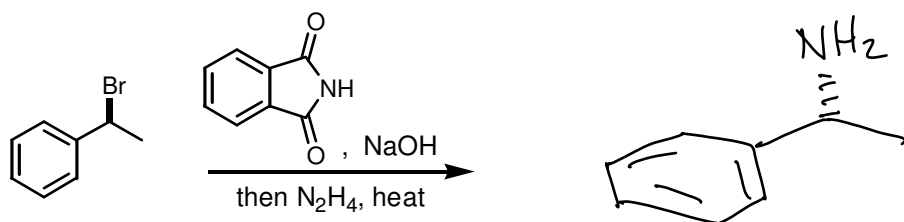
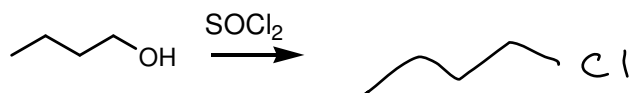
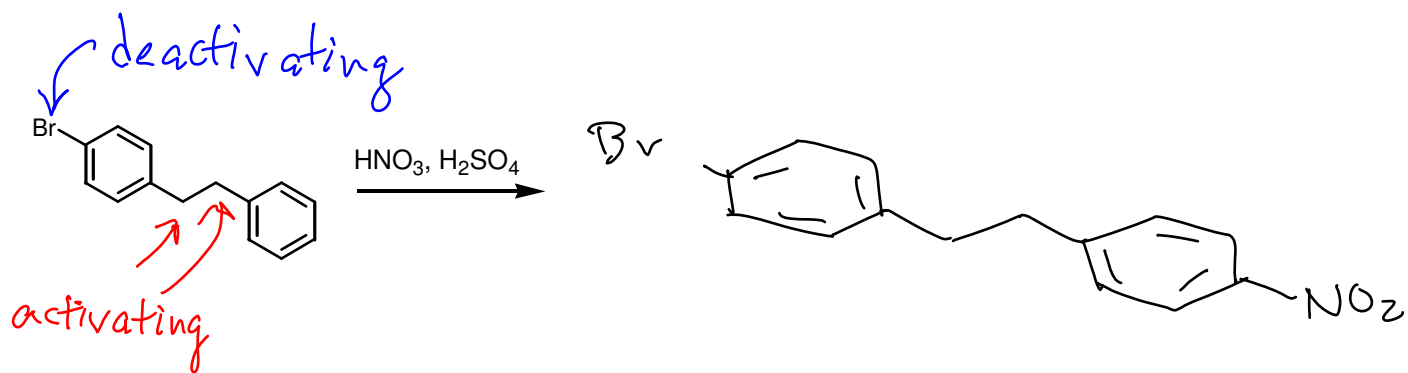
2. What is the most important question in chemistry?

4. What are two of the "black box" rules discussed in the first weeks of class?

Show the products from the following reactions, including stereochemistry where possible. If more than one product is expected, indicate which is the major. 4 marks each







Propose an efficient synthesis of the following molecule using any reagents you want provided that none adds more than 5 carbons at a time to the final product.

