Chemistry 233 Final Exam – Supplemental Data

The Periodic Table

1																	18
IA																	VIIIA
1	_											10			1.0	10	2
H	2											13	14	15	16	17	He
1.01	IIA	ř									1	IIIA	IVA	VA	VIA	VIIA	4.00
3	4											5	6	7	8	9	10
Li	Be											В	C	N	О	F	Ne
6.94	9.01											10.81	12.01	14.01	16.00	19.00	20.18
11	12											13	14	15	16	17	18
Na	Mg	3	4	5	6	7	8	9	10	11	12	Al	Si	P	S	Cl	Ar
22.99	24.31	IIIB	IVB	VB	VIB	VIIB		VIIIB		IB	IIB	26.98	28.09	30.97	32.07	35.45	39.95
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
39.1	40.08	44.96	47.88	50.94	52.00	54.94	55.85	58.93	58.69	63.55	65.39	69.72	72.61	74.92	78.96	79.90	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	Te	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
85.47	87.62	88.91	91.22	92.91	95.94	(98)	101.07	102.91	106.42	107.87	112.41	114.82	118.71	121.76	127.6	126.9	131.29
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
132.9	137.3	138.9	178.5	180.9	183.9	186.2	190.2	192.2	195.1	197.0	200.6	204.4	207.2	209	(209)	(210)	(222)
87	88	89	104	105	106	107	108	109	110	111					1_1-1-1	(_10)	
Fr	Ra	Ac^	Rf	Db	Sg	Bh	Hs	Mt	Ds	Rg							
(223)	(226)	(227)	(261)	(262)	(263)	(264)	(265)	(268)	(271)	(272)							

ſ	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
- 1	140.1	140.9	144.2	(145)	150.4	152.0	157.3	158.9	162.5	164.9	167.3	168.9	173.0	175.0
- [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
- 1	232.0	(231)	238.0	(237)	(244)	(243)	(247)	(247)	(251)	(252)	(257)	(258)	(259)	(260)

Common 1H NMR Chemical Shifts OH Carboxylic aldehyde aromatic vinyl A Carboxylic acid T A Carboxylic acid A Carboxylic acid

Competition Between Substitution and Elimination Tertiary Secondary Allylic Benzylic Primary Methyl Solution Solution

<u>Substrate</u>	Base/Nucleophile	Experimental Finding
10	strong	S _N 2 favored over E2
2°	strong	E2 favored over S _N 2
3°	strong	E2 favored over S _N 1 and E1
2º, benzylic, allylic	weak	Both E1 & S _N 1 Products
Any	any base	Heat favors elimination over substitution