Dec. 26,2006

- 1. Starting with 2-aminobenzotrifluoride, and using any other required reagents, show how you would synthesize 2,2'-bis(trifluoromethyl)-4,4'-diaminobiphenyl.(15%)
- 2. Starting with 3,5-dimethoxybenzaldehyde and 4-methoxybenzyl alcohol, and using any other required reagents, show how you would synthesize 3,4',5-trihydroxystilbene(1-(hydroxyphenyl)-2-(3,5-dihydroxyphenyl)ethene). (20%)
- 3. Give conformational structures for the major product formed when 1-tert-butylcyclohexene reacts with each of the following reagents. If the product would be obtained as a racemic form you should so indicate. (15%) (a) Br₂, CCl₄ (b) OsO₄, then aqueous NaHSO₃ (c) C₆H₅CO₃H, then H₃O⁺, H₂O
- 4. Give structures for compounds A-E. (15%)

Cyclohexanol
$$\frac{H_2CrO_4}{\text{acetone}} = A(C_6H_{10}O) = \frac{CH_3Mgl}{H_3O} = B(C_7H_{14}O) = \frac{HA}{\text{heat}}$$

$$C(C_7H_{12}) = \frac{O_3}{\text{Zn, HOAc}} = D(C_7H_{12}O_2) = \frac{Ag_2O, OH}{H_3O} = E(C_7H_{12}O_3)$$

- 5. Give structural formulas for the products of the reaction (if one occurs) when propanal is treated with each of the following reagents: (10%) (a) OH, H₂O (b) C₆H₅CHO, OH (c) HCN (d) NaBH₄ (e) Ag₂O, OH, then H₃O[†].
- 6. Many polycyclic aromatic compounds have been synthesized by a cyclization reaction known as the Bradsher reaction or aromatic cyclodehydration. This method can be illustrated by the following synthesis of 9-methylphenanthrene.An arenioum ion is an intermediate in this reaction, and the last step involves the dehydration of an alcohol. Propose a plausible mechanism for this example of the Bradsher reaction. (15%)

9-Methylphenanthrene

7. What product (or products) would you expect to obtain when the following compounds undergo ring bromination with Br₂ and FeBr₃? (10%)

考	試	月	日上午	**			任 課
時	間	(星期	下午第)晚間	節	份	數	教師

國立臺灣科技大學 95

學年度第 ≥ 學期博· 按格式命題用紙

第 1. 页共 3 页

96.	6.	1	考	試	科	目	:	高等	有机	化学
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4			IIC CHEMISTRY	TEST 5%	for each			
1.	Using the (E) - (Z) designation give IUPAC names for each of	n the following:			-			-
	ci	cc						
	H Br	H `	CI					
								
- , -	58 2							
2.	Some primary and seconda ton skeletons during dehydrat	ry alcohols also under tion,	rgo rearrangeme	ents of their car-			٤ ٤	
	dimethyl-2-butanol:					(1/2-	-c-/-CM	
	CH ₃						4	— (N-=
	CH ₃ -C	H,PO₄ *C					9	
	CH ³ OH							
- , -	C		f					
_ 3. _	reagents, and you nee	, outline syntheses of ed not show the synthe	sis of compounds	lowing. You may prepared in earlie	use any other r parts of this p	neede		
	(a) Propyne	(b)	CH₃CH₂(7		
				-			·····	
	o							
4.	4 RCH + NaB	H ₂ + 3 H ₂ O →						
	-	o						
	CH ₃ CH ₂	CH ₂ CH NaBH ₄ →			. 			
	Buts	anai .						
	CH.C	H ₂ CCH ₃ NaBH ₄ →				***		
		H ₂ CCH, H ₂ O						
	But	tanone						
		lanone			(1) other#	-		
5.			tion	RMgX + C	$O \xrightarrow{(1) \text{ ether*}} I$	R-С-О-H +	MgX ₂	
5.		lanone	tion	RMgX + C=	$O \xrightarrow{(1) \text{ ether}^a} I$ $Q \xrightarrow{(2) H_3 O^+ X^-} I$	R-С-О-Н+	MgX ₂	
5.	A Mechanism	n for the Reac					MgX ₂	
	A Mechanism	n for the Reac					MgX ₂	
	What products woul each of the following	n for the Reac d you expect from the g reagents?	reaction of ethylm O 	nagnesium bromide			MgX ₂	
	A Mechanism	n for the Reac d you expect from the g reagents?		nagnesium bromide			MgX ₂	
6.	What products woul each of the following	n for the Reac d you expect from the g reagents?	reaction of ethyln $ \begin{array}{c} O \\ \parallel \\ O \\ C_6H_5COCH_3, t1 \end{array} $	nagnesium bromid nen NH ₄ Cl, H ₂ O	e (CH₃CH₂MgB		MgX ₂	
6.	What products woul each of the following (a) H ₂ O What	d you expect from the g reagents? (b) organic products wouldethyllithium + 1-buty	reaction of ethyln O C ₆ H ₂ COCH ₃ , th d you expect from the \longrightarrow	nagnesium bromide then NH ₄ Cl, H ₂ O	e (CH₃CH₂MgB		MgX ₂	
6.	What products woul each of the following (a) H ₂ O What	d you expect from the g reagents?	reaction of ethyln O C ₆ H ₂ COCH ₃ , th d you expect from the \longrightarrow	nagnesium bromide then NH ₄ Cl, H ₂ O	e (CH₃CH₂MgB		MgX ₂	
6.	What products woul each of the following (a) H ₂ O What	d you expect from the g reagents? (b) organic products wouldethyllithium + 1-buty	reaction of ethyln O \parallel $C_6H_3COCH_3$, the distribution of the control of t	nagnesium bromide then NH ₄ Cl, H ₂ O	e (CH₃CH₂MgB		MgX ₂	
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6.	What products woul each of the following (a) H ₂ O What (a) M (b) P	d you expect from the g reagents? (b) organic products wouldethyllithium + 1-buty	of thyln C ₆ H ₅ COCH ₅ , the discrete from the	nagnesium bromide then NH ₄ Cl, H ₂ O	e (CH₃CH₂MgB		MgX ₂	
6.	What products woul each of the following (a) H ₂ O What (a) M (b) P	d you expect from the g reagents? (b) organic products would the still the	o C ₆ H ₃ COCH ₃ , the dyou expect from the MH	nagnesium bromide then NH ₄ Cl, H ₂ O	e (CH₃CH₂MgB		MgX ₂	
6.	What products woul each of the following (a) H ₂ O What (a) M (b) P	d you expect from the g reagents? (b) organic products wouldethyllithium + 1-buty	reaction of ethylm O C ₆ H ₃ COCH ₃ , the displayed from the control of the con	nagnesium bromide then NH ₄ Cl, H ₂ O	e (CH₃CH₂MgB		MgX ₂	
6.	What products woul each of the following (a) H ₂ O What (a) M (b) P	d you expect from the g reagents? (b) organic products would the still the	d you expect from the manner, then NH BryCCI, dark, 25°C KMnO7/A,O 25°C H,O°/H,O heat	nagnesium bromide then NH ₄ Cl, H ₂ O	e (CH₃CH₂MgB		MgX ₂	
6.	What products woul each of the following (a) H ₂ O What (a) M (b) P	d you expect from the g reagents? (b) organic products would the still the	reaction of ethylm O C ₆ H ₃ COCH ₃ , the displayed from the control of the con	nagnesium bromide then NH ₄ Cl, H ₂ O	e (CH₃CH₂MgB		MgX ₂	
6.	What products woul each of the following (a) H ₂ O What (a) M (b) P	d you expect from the g reagents? (b) organic products would the still the	d you expect from the manner, then NH BryCCI, dark, 25°C KMnO7/A,O 25°C H,O°/H,O heat	nagnesium bromide then NH ₄ Cl, H ₂ O	e (CH₃CH₂MgB		MgX ₂	
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6. 9. (a)	What products woul each of the following (a) H ₂ O 7. What (a) M (b) P	d you expect from the g reagents? (b) organic products would dethyllithium + 1-buty roduct of (a) + cyclohed between the control of the cyclohed between t	reaction of ethylm O C ₆ H ₅ COCH ₃ , the discrete from the control of the cont	magnesium bromidenen NH ₄ Cl, H ₂ O \longrightarrow	e (CH₃CH₂MgB		MgX ₂	
6. 9. (a)	What products woul each of the following (a) H ₂ O 7. What (a) M (b) P	d you expect from the g reagents? (b) organic products would the styling thin the styling thin the styling the styling that the styling the styling that the	reaction of ethylm O C ₆ H ₅ COCH ₃ , the discrete from the control of the cont	nagnesium bromidenen NH_4Cl , H_2O n each of the follow I_4Cl , $H_2O \longrightarrow$	e (CH ₃ CH ₂ MgB	r) with		g hypothetic
6. 9. (a)	What products woul each of the following (a) H ₂ O 7. What (a) M (b) P	d you expect from the g reagents? (b) organic products would the styllithium + 1-buty troduct of (a) + cyclohology and the styllithium + 1-buty troduct of (a) + cyclohology and the styllithium + 1-buty troduct of (b) + cyclohology and the styllithium + 1-buty troduct of (a) + cyclohology and the styllithium + 1-buty troduct of (b) + cyclohology and the styllithium + 1-buty troduct of (b) + cyclohology and the styllithium + 1-buty troduct of (b) + cyclohology and the styllithium + 1-buty troduct of (b) + cyclohology and the styllithium + 1-buty troduct of (b) + cyclohology and the styllithium + 1-buty troduct of (b) + cyclohology and the styllithium + 1-buty troduct of (b) + cyclohology and the styllithium + 1-buty troduct of (b) + cyclohology and the styllithium + cycloho	reaction of ethylm O C ₆ H ₅ COCH ₃ , the discrete from the control of the cont	nagnesium bromidenen NH_4Cl , H_2O n each of the follow I_4Cl , $H_2O \longrightarrow$	e (CH ₃ CH ₂ MgB	r) with	onsider the followin	g hypothetic
6. 9. (a)	What products woul each of the following (a) H ₂ O 7. What (a) M (b) P	d you expect from the g reagents? (b) organic products would the styling thin the styling thin the styling the styling that the styling the styling that the	reaction of ethylm O C ₆ H ₅ COCH ₃ , the discrete from the control of the cont	nagnesium bromidenen NH ₄ Cl, H ₂ O n each of the follow 1 ₄ Cl, H ₂ O tical transforma-	ving reactions?	ctatetraene we co		g hypothetic
6. 9. (a)	What products woul each of the following (a) H ₂ O 7. What (a) M (b) P	d you expect from the g reagents? (b) organic products would the styling thin the styling thin the styling the styling that the styling the styling that the	reaction of ethylm O C ₆ H ₅ COCH ₃ , the discrete from the control of the cont	nagnesium bromidenen NH ₄ Cl, H ₂ O n each of the follow 1 ₄ Cl, H ₂ O tical transforma-	e (CH ₃ CH ₂ MgB	ctatetraene we co		g hypothetic

考	試	月	日上午				任	课	
時	閘	(星期	下午第)晚間	鈴	份	數			

國立臺灣科技大學

學年度第 學期 考試命題用紙

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考試科目:	□ 大學部 系班別:
	ORGANIC CHEMISTRY TEST 5% for each
10.	Write structural formulas and give acceptable names for all representatives of the following: (a) Tribromobenzenes (d) Methylbenzenesulfonic acids
11. (a) —	$ \begin{array}{c c} C & C \\ C & $
	benzene 80°C CH,C excess benzene 80°C
12.	Acetic anhydride (a carboxylic acid anhydride) CH ₃ CH ₂ CH ₂ CH ₂ Br AlCl ₃
	Violisty.
<u></u>	edel-Crafts reactions
13.	Starting with benzene, outline a synthesis of each of the following: (a) Isopropylbenzene (b) m-Dinitrobenzene
·	
,14. _–	Write mechanisms that account for the products of the following reactions: H,C C _b H ₃
And the second second	(a) \xrightarrow{HA} phenanthrene (b) 2 CH, \xrightarrow{C} CH, \xrightarrow{HA}
	CH,OH CH,
⁻ 15. ⁻	(1) LiAIH(O-1-Bu), -78°C
	Aldehyde
	(b)(i) DIBAL-H. hexane78°C
	R H Aldehyde
	$(c) \longrightarrow (l) DIBAL-H. hexane \downarrow 0$ $(2) H2 \longrightarrow D (2) H2 \longrightarrow D$
	R H Aldehyde
 16.	What monobromination product (or products) would you expect to obtain when the following compounds undergo ring bromination with Br ₂ and FeBr ₃ ?
{- ·-···♥	$\begin{array}{cccccccccccccccccccccccccccccccccccc$
	Chlorination of most higher alkanes
17	
-	CH ₃ CHCH ₃ Ci ₂ → light
	Isobutane
· · · · · · · · · · · · · · · · · · ·	

考言	试	月	日上午	84			任	裸	
時月	V)	(星期)晚間	節	份	數	教	師	

國立臺灣科技大學

考試科目:

學年度第 考試命題用紙

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