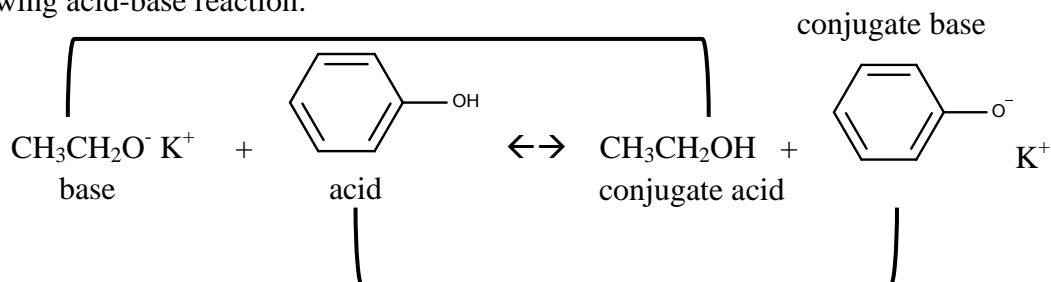


Organic Chemistry Practice Problems

Organic Chemistry I Practice Set #1 (Chapter 1 – Carey)

Consider the following acid-base reaction:



To decide on which side the equilibrium lies:

- 1) Identify conjugate acid-base pairs (connect above with lines);
- 2) If you know the pK_a values (or they are given), the equilibrium lies **AWAY FROM THE STRONGER ACID**. The stronger acid has lower pK_a

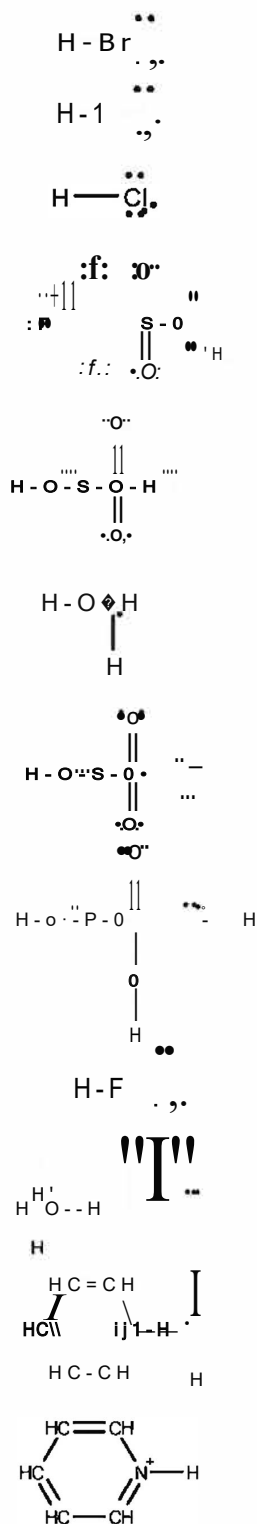
Instructions: **Draw the correct Lewis Structures for each acid and conjugate base in the table below. Place a * (star) next to each one that has resonance structure(s). HA = acid; A⁻ = conjugate base**

HA	pK_a	A ⁻	HA	pK_a	A ⁻
HI	-10	I ⁻	CH ₃ CH ₂ NH ₃ ⁺	11	CH ₃ CH ₂ NH ₂
HBr	-6	Br ⁻	CH ₃ COCH ₂ CO ₂ CH ₂ CH ₃	11	[CH ₃ COCHCO ₂ CH ₂ CH ₃] ⁻
HCl	-4	Cl ⁻	HPO ₄ ²⁻	12	PO ₄ ³⁻
CF ₃ SO ₃ H	-6	CF ₃ SO ₃ ⁻	(CH ₃ CH ₂ O ₂ C) ₂ CH ₂	13	(CH ₃ CH ₂ O ₂ C) ₂ CH ⁻
H ₂ SO ₄	-5	HSO ₄ ⁻	(NH ₂) ₂ C=NH ₂ ⁺	13	(NH ₂) ₂ C=NH
H ₃ O ⁺	-2	H ₂ O	CH ₃ CONH ₂	14	CH ₃ CONH ⁻
HSO ₄ ⁻	2	SO ₄ ²⁻	H ₂ O	15.7	HO ⁻
H ₃ PO ₄	2	H ₂ PO ₄ ⁻	CH ₃ OH	15.2	CH ₃ O ⁻
HF	3.5	F ⁻	CH ₃ CH ₂ OH	16	CH ₃ CH ₂ O ⁻
CH ₃ CO ₂ H	4.7	CH ₃ CO ₂ ⁻	(CH ₃) ₂ CHOH	17	(CH ₃) ₂ CHO ⁻
PhNH ₃ ⁺	4.6	PhNH ₂	(CH ₃) ₃ COH	18	(CH ₃) ₃ CO ⁻
C ₅ H ₅ N ⁺ H (pyridinium)	5.2	C ₅ H ₅ N	CH ₃ COCH ₃	19	CH ₃ COCH ₂ ⁻
H ₂ CO ₃	6.4	HCO ₃ ⁻	CH ₃ CO ₂ CH ₂ CH ₃	25	⁻ CH ₃ CO ₂ CH ₂ CH ₃
H ₂ PO ₄ ⁻	7	HPO ₄ ²⁻	HC≡CH	26	HC≡C ⁻
H ₂ S	7	HS ⁻	H ₂	35	H ⁻
PhSH	7	PhS ⁻	NH ₃	36	NH ₂ ⁻
NH ₄ ⁺	9	NH ₃	PhCH ₃	41	[PhCH ₂] ⁻
(CH ₃ CO) ₂ CH ₂	9	(CH ₃ CO) ₂ CH ⁻	CH ₂ =CHCH ₃	43	[CH ₂ =CHCH ₂] ⁻
HCN	9	CN ⁻	PhH	43	Ph ⁻
PhOH	10	PhO ⁻	CH ₂ =CH ₂	45	[CH ₂ =CH] ⁻
HCO ₃ ⁻	10	CO ₃ ²⁻	CH ₃ CH ₃	62	[CH ₃ CH ₂] ⁻
CH ₃ SH	11	CH ₃ S ⁻			

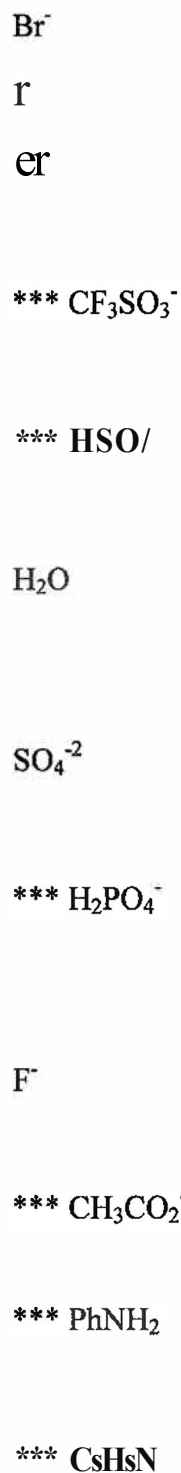
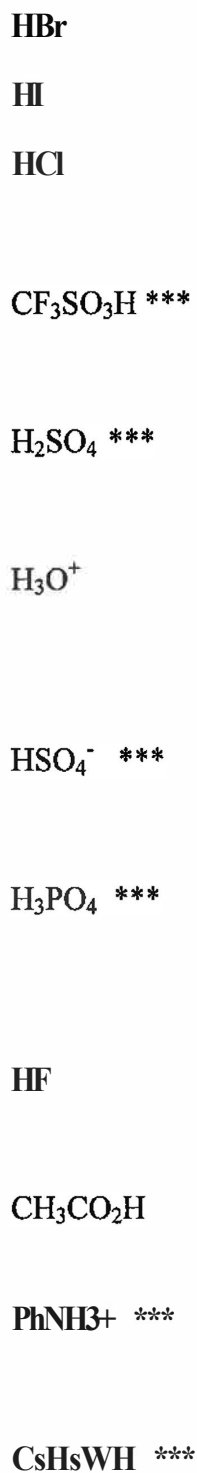


Organic Chemistry Practice Problems

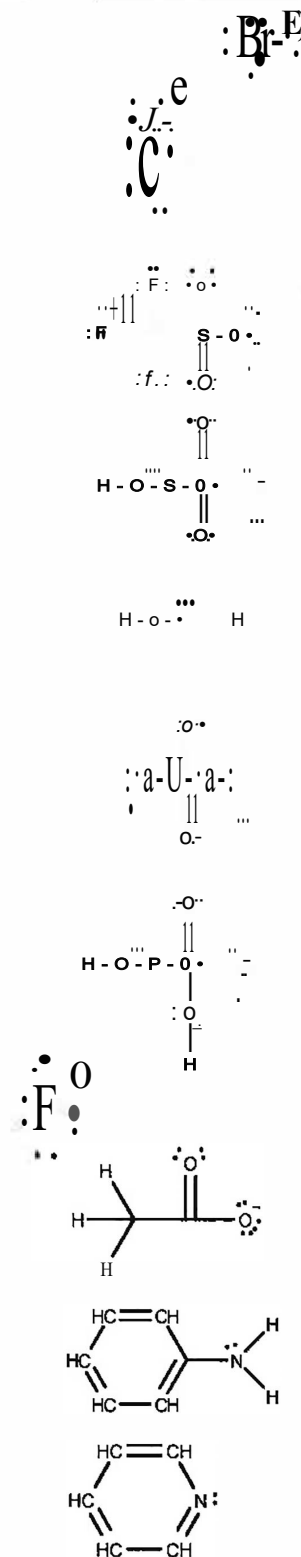
Acids



Organic Chemistry I Answers to Practice Set #1 (Chapter 1 - Carey)



Conjugate Bases

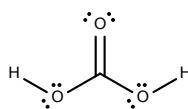
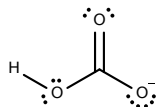
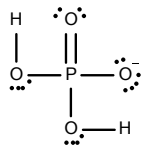
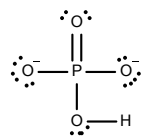
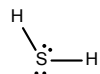

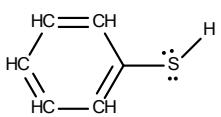
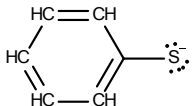
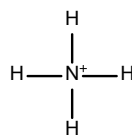
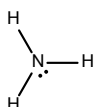
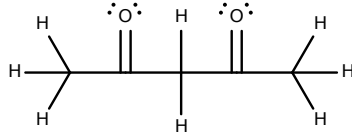
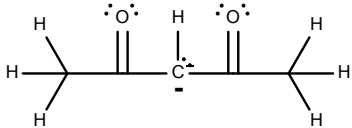
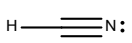
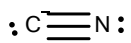
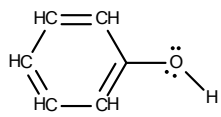
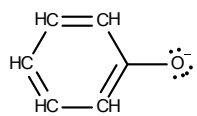
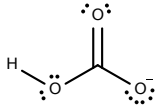
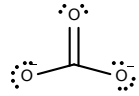
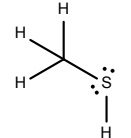
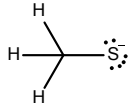
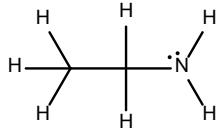
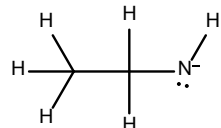


Organic Chemistry Practice Problems

Acids

Organic Chemistry I Answers to Practice Set #1 (Chapter 1 - Carey)

Conjugate Bases

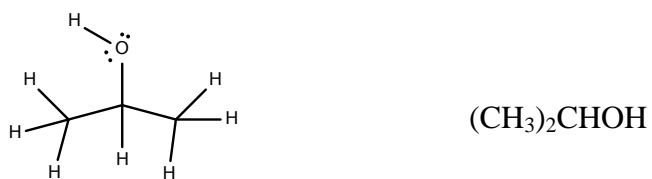
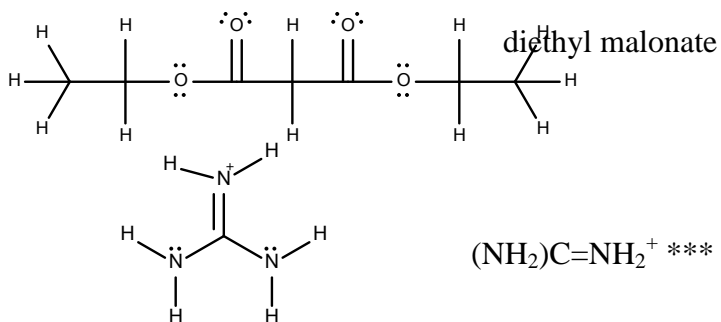
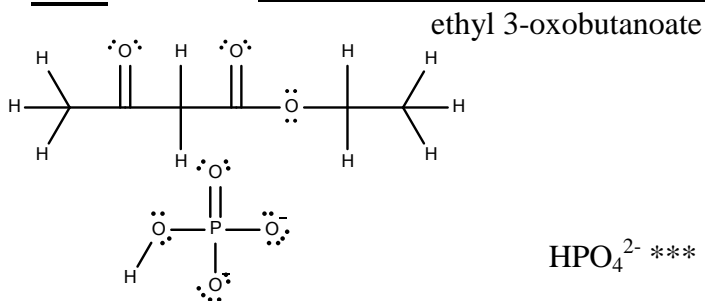
	H_2CO_3	*** HCO_3^-	
	H_2PO_4^- ***	*** HPO_4^{2-}	
	H_2S	HS^-	
	PhSH ***	*** PhS^-	
	NH_4^+	NH_3	
	$(\text{CH}_3\text{CO})_2\text{CH}_2$	*** $(\text{CH}_3\text{CO})_2\text{CH}^-$	
	HCN	CN^-	
	PhOH ***	*** PhO^-	
	HCO_3^- ***	*** CO_3^{2-}	
	CH_3SH	CH_3S^-	
	$\text{CH}_3\text{CH}_2\text{NH}_2$	$\text{CH}_3\text{CH}_2\text{NH}^-$	

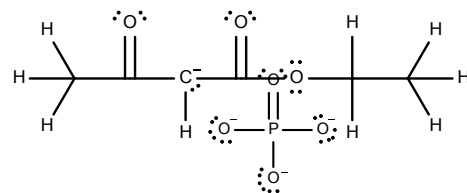
Organic Chemistry Practice Problems

Acids

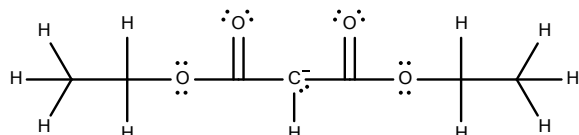
Organic Chemistry I Answers to Practice Set #1 (Chapter 1 – Carey)

Conjugate Bases

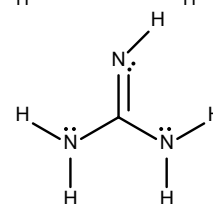




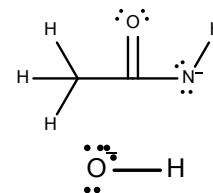
*** PO_4^{3-}



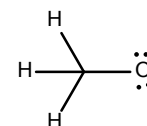
$(\text{NH}_2)\text{C}=\text{NH}$



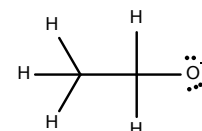
*** CH_3CONH^-



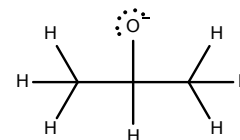
OH^-



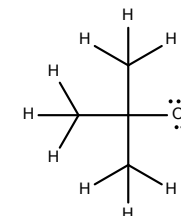
CH_3O^-



$\text{CH}_3\text{CH}_2\text{O}^-$



$(\text{CH}_3)_2\text{CHO}^-$



$(\text{CH}_3)_3\text{O}^-$

Organic Chemistry Practice Problems

Acids

Organic Chemistry I Answers to Practice Set #1 (Chapter 1 – Carey)

Conjugate Bases

