

(25) **Today**

Chap 6 Acid-Base and Donor-Acceptor
Chemistry

Next Class (26)

Chap 6 Acid-Base and Donor-Acceptor
Chemistry

Chap 9.1 Introduction to Coordination
Chemistry

(27) **Second Class from Today**

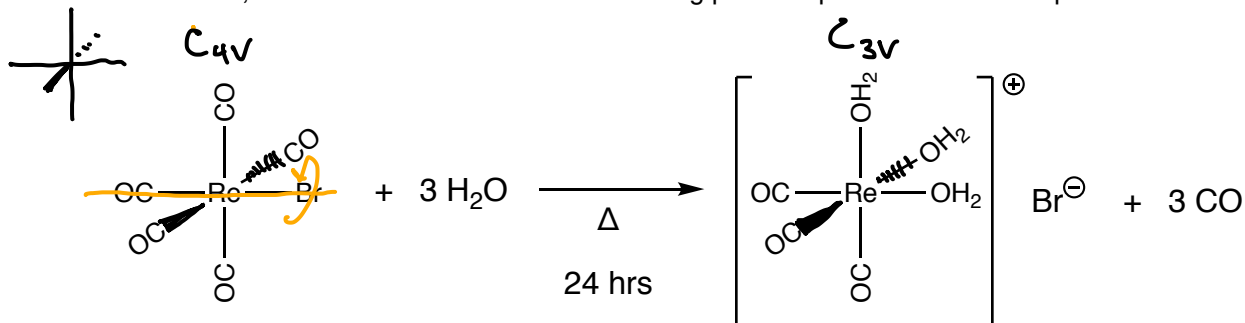
Chap 9.1 Introduction to Coordination
Chemistry

Third Class from Today (28)

Chap 9.1 Introduction to Coordination
Chemistry

Project 2
Due Friday, November 22

Bromopentacarbonylrhenium(I) can be converted to triaquotricarbonylrhenium(I) bromide by refluxing in water. Determine if the number of stretching bands in the IR spectrum will change; that is, determine the number of IR stretching peaks expected for both compounds



Symmetry of the CO stretches

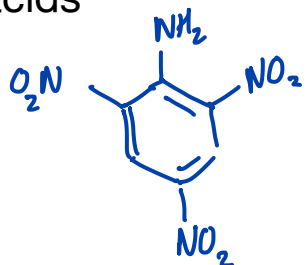
C_{3v}	E	$2 C_3$	$3 \sigma_v$	
A_1	1	1	1	Z
A_2	1	1	-1	R_z
E	2	-1	0	x, y, R_x, R_y
Γ	3	0	1	

$$\Gamma = A_1 + E$$

IR active IR active degenerate

2 IR peaks observed

Super acids



Hammett acidity function

Section 6.1, 6.2,
6.3, 6.4

$$H_0 = pK_{BH^+} - \log \left(\frac{[BH^+]}{[B]} \right)$$

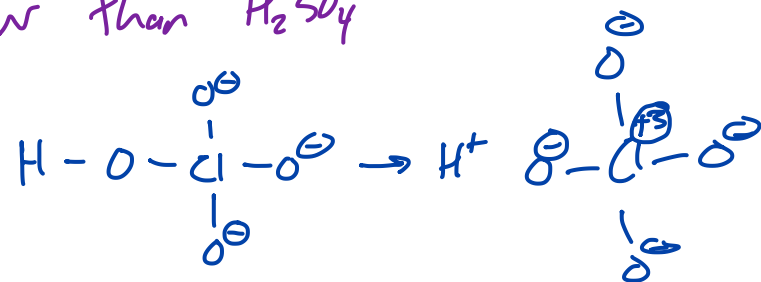
H₂SO₄

-11.9

stronger than H₂Sb₄

HClO₄

-13.0



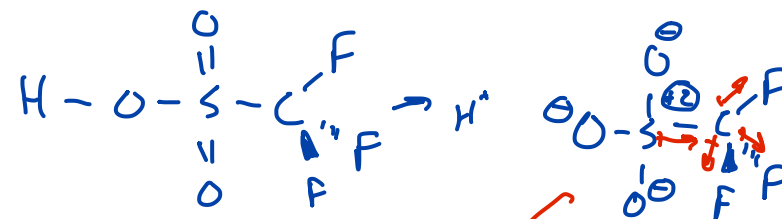
HSO₃CF₃

triflic acid

-14.6

HSO₃F

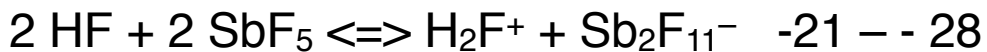
-15.6



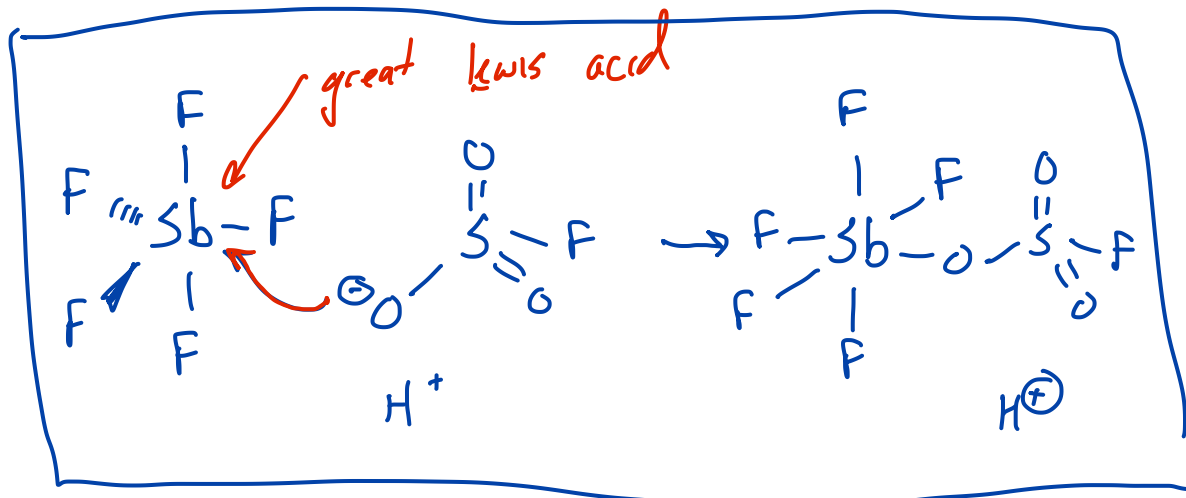
HSO₃F-SbF₅

10⁹ - 10¹⁴ x stronger than H₂SO₄

-21 - -25

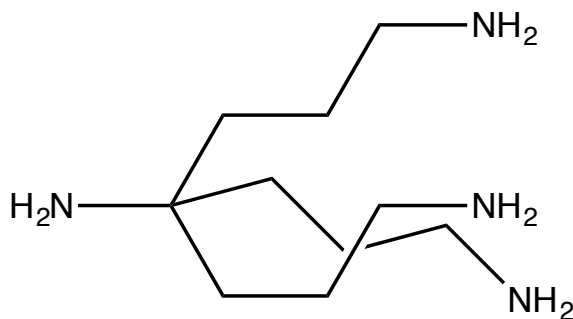
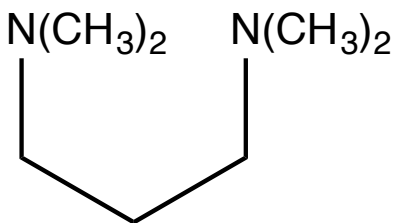
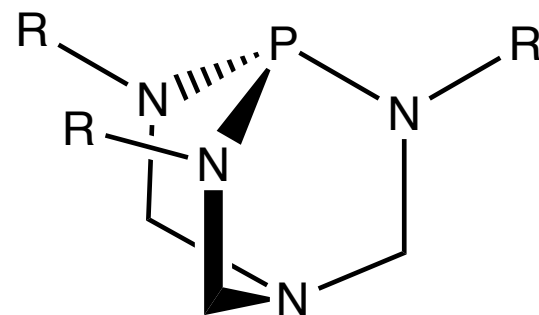
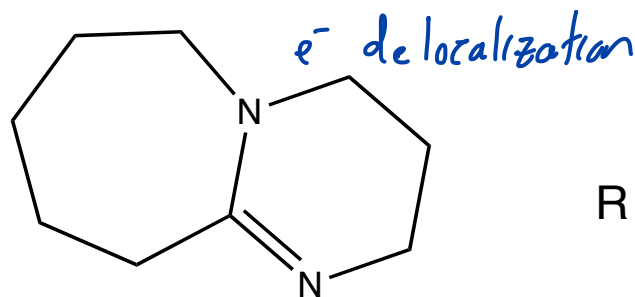
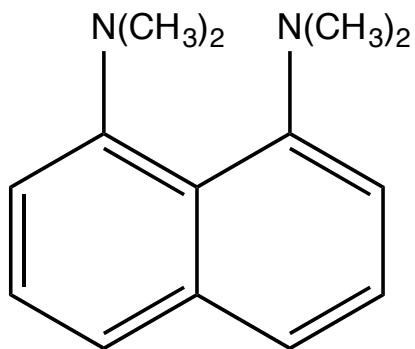
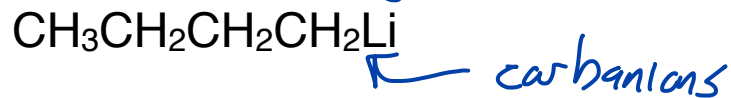


BL acids



eneg F atoms help distribute the ⊖ charge + stabilize it

Different techniques for creating super bases



stabilizing protonated atom

bases with H-bonding interactions



not formed from direct abstraction of an H^+ from butane



methyl lithium can be prepared similarly



↑ dangerous... will react with water and moisture in air to form flammable gases + heat which can lead to fires and explosions if precautions are not taken

another downside to these super bases is that they are relatively small and can perform nucleophilic attacks on electrophiles in addition to acting like a base



irreversible, product is a gas + Li ions in reaction solution