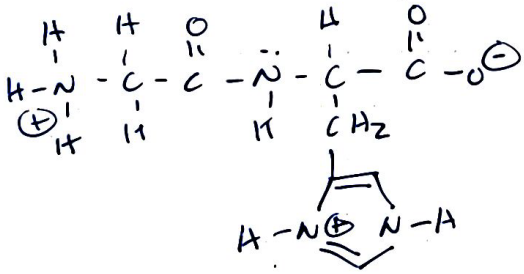
CHEM523 Homework 1 Key

(1) A) Proline, Pro, P
B) Tyrosine, Tyr, Y
C) Leucine, Leu, L
D) Lysine, Lys, K

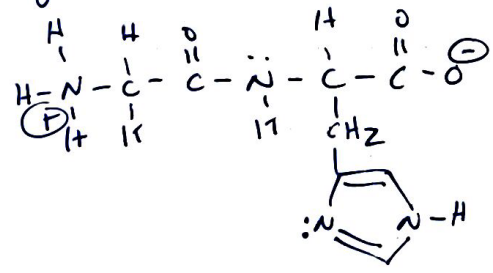
(2) a) Pro, Leu
b) Lys
c) Lys
d) Lys
e) Tyr

(3) Gly-His @ pH 5.5



+1 charge

Gly-His @ pH 7.5



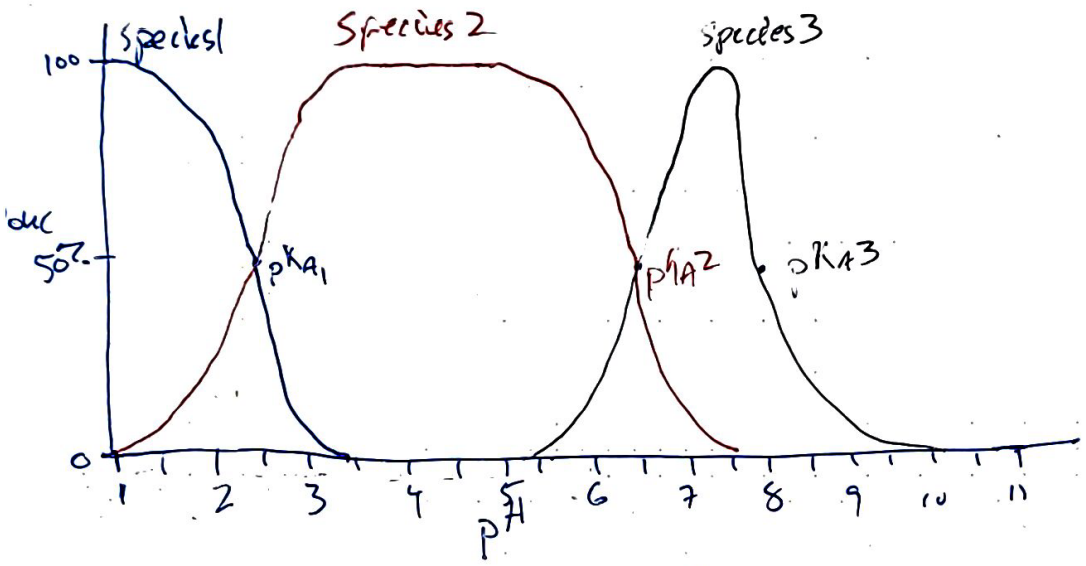
∅ charge

(4) Histidine has 3 ionizable groups: (See Table 2.1)

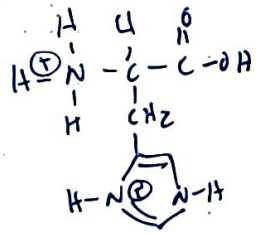
Amino group $pK_A = 8$ (pK_{A3})

Imidazole group $pK_A = 6.4$ (pK_{A2})

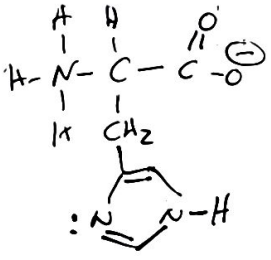
Carboxylic acid group $pK_A = 2.5$ (pK_{A1})



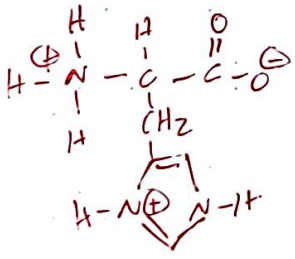
Species1: Everything protonated



species 3: Imidazole Deprotonated



Species 2: Carboxylic acid deprotonated



After pK_{A3}, everything is deprotonated.

5) Ion - Dipole
Dipole - Dipole
Dipole - Induced Dipole
London dispersion forces