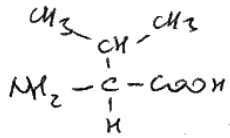


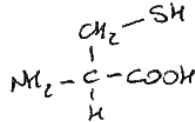
COMPITO DI CHIMICA ORGANICA LCh 21-5-2010

1) Scrivere strutture nono invec e Trestronali di VAL, CYS, LYS, TYR, GLU



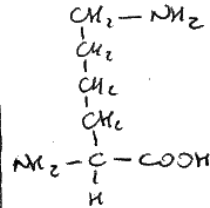
L-VALINA

Acido (2S)-2-ammino-3-metilbutanoico



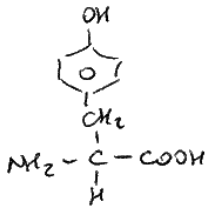
L-CISTEINA

Acido (2S)-2-ammino-3-mercapto propanoico



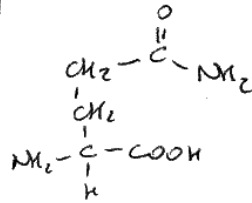
L-LISINA

Acido (2S)-2,6-diammino eranoico



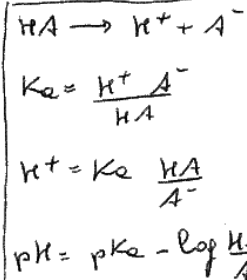
L-TIROSINA

Acido (2S)-2-ammino-3-(4-idrossifenil) propanoico



L-GLUTAMINA

Acido (2S)-2,5-diammino-5-oxo pentanoico



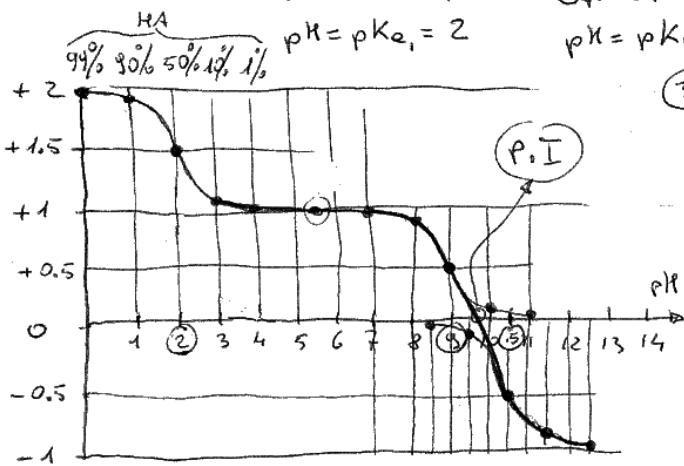
$\text{pH} = \text{p}K_a - 0$
 $0 = \log 1$ ($[\text{HA}] = [\text{A}^-]$)
 $[\text{HA}] = 50\%$

$\text{pH} = \text{p}K_a - 1$
 $1 = \log 10$ ($[\text{HA}] = 10 [\text{A}^-]$)
 $[\text{HA}] \approx 90\%$

$\text{pH} = \text{p}K_a - 2$
 $2 = \log 100$ ($[\text{HA}] = 100 [\text{A}^-]$)
 $[\text{HA}] \approx 99\%$

2) Scrivere le forme acido/basi di LYS al variare del pH e disegnarne il grafico

$\begin{array}{c} \text{NH}_3^+ \\ \\ (\text{CH}_2)_4 - \text{NH}_3^+ \\ \\ \text{NH}_2 - \text{C} - \text{COOH} \\ \\ \text{H} \end{array}$ <p>CARICA 2+ pH ≈ 0</p>	$\begin{array}{c} \text{NH}_3^+ \\ \\ (\text{CH}_2)_4 - \text{NH}_3^+ \\ \\ \text{NH}_3^+ - \text{C} - \text{COO}^- \\ \\ \text{H} \end{array}$ <p>CARICA +1 pH = (9+2)/2 = 5.5</p>	$\begin{array}{c} \text{NH}_3^+ \\ \\ (\text{CH}_2)_4 - \text{NH}_3^+ \\ \\ \text{NH}_2 - \text{C} - \text{COO}^- \\ \\ \text{H} \end{array}$ <p>CARICA 0 (P.I.) pH = (9+10.5)/2 = 9.75</p>	$\begin{array}{c} \text{NH}_2 \\ \\ (\text{CH}_2)_4 - \text{NH}_2 \\ \\ \text{NH}_2 - \text{C} - \text{COO}^- \\ \\ \text{H} \end{array}$ <p>CARICA -1 pH ≈ 13</p>
$\begin{array}{c} \text{NH}_3^+ \\ \\ (\text{CH}_2)_4 - \text{NH}_3^+ \\ \\ \text{NH}_3^+ - \text{C} - \text{COOH} / \text{COO}^- \\ \\ \text{H} \end{array}$ <p>CARICA +1,5 pH = pKa₁ = 2</p>	$\begin{array}{c} \text{NH}_3^+ \\ \\ (\text{CH}_2)_4 - \text{NH}_3^+ \\ \\ \text{NH}_2 / \text{NH}_3^+ - \text{C} - \text{COO}^- \\ \\ \text{H} \end{array}$ <p>CARICA +0,5 pH = pKa₂ = 9</p>	$\begin{array}{c} \text{NH}_2 / \text{NH}_3^+ \\ \\ (\text{CH}_2)_4 - \text{NH}_2 / \text{NH}_3^+ \\ \\ \text{NH}_2 - \text{C} - \text{COO}^- \\ \\ \text{H} \end{array}$ <p>CARICA -0,5 pH = pKa₃ = 10.5</p>	$\begin{array}{c} \text{NH}_2 \\ \\ (\text{CH}_2)_4 - \text{NH}_2 \\ \\ \text{NH}_2 - \text{C} - \text{COO}^- \\ \\ \text{H} \end{array}$ <p>CARICA -1 pH = pKa + 1 -1 = log 1/10 [HA] = 1/10 [A] [HA] ≈ 10%</p> <p>CARICA -2 -2 = log 1/100 [HA] = 1/100 [A] [HA] ≈ 1%</p>



3) INDICA come si muovono a pH 6 in elettroforesi i seguenti AA: LYS ARG HIS GLU VAL

$\text{PI}(\text{LYS}) = (9+10.5)/2 = 9.75$ $\text{PI}(\text{VAL}) = (2+9)/2 = 5.5$
 $\text{PI}(\text{ARG}) = (9+12.5)/2 = 10.75$
 $\text{PI}(\text{HIS}) = (6+9)/2 = 7.5$
 $\text{PI}(\text{GLU}) = (2+4)/2 = 3$

	3	5,5	7,5	9,75	10,75	
GLU	+					
VAL	+	+				
HIS	+	+	+			
LYS	+	+	+	+	+	
ARG	+	+	+	+	+	

SI SPOSTA VERSO ANODO (+) CATODO CATODO CATODO (-)