DLTES

ácido carbónico/bicarbonato/carbonato-Ca a pCa = 0

QA III Alejandro Baeza 2019-2

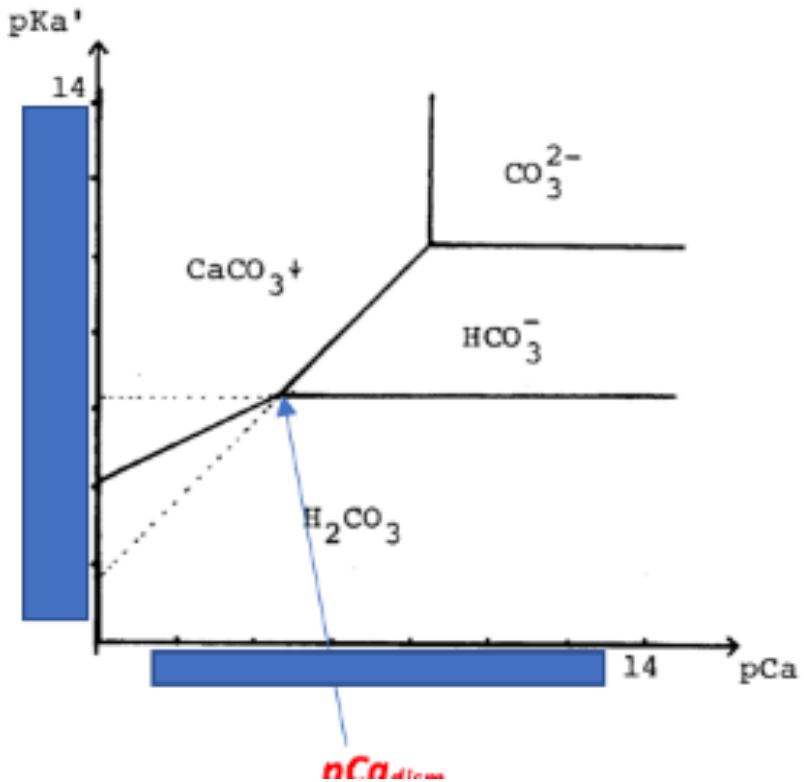
FQ UNAM

Si:

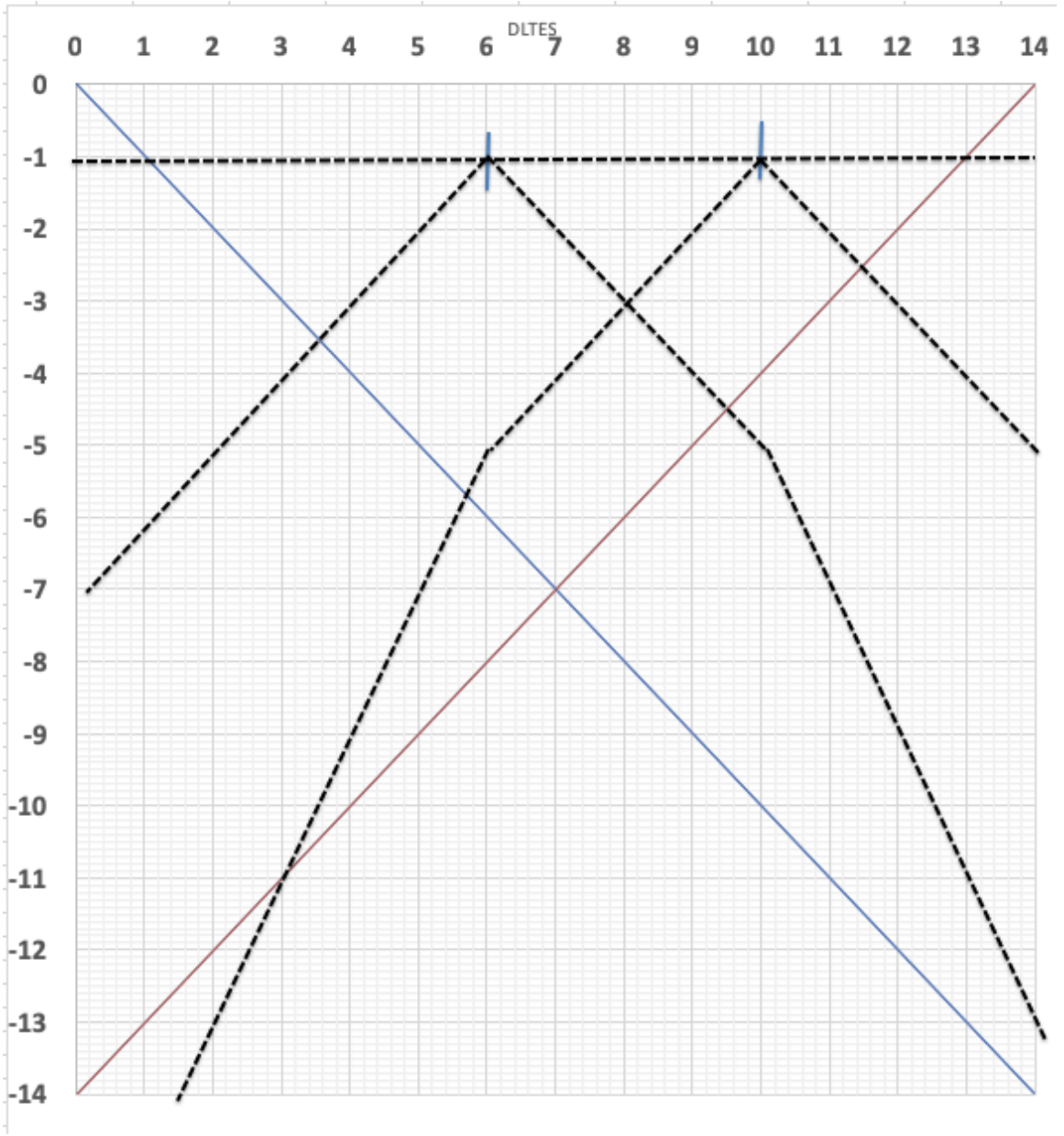
$$H_2CO_3 \rightleftharpoons HCO_3^- + H^+ \qquad pKa_2 = 6.37$$

$$HCO_3^- \rightleftharpoons CO_3^{2-} + H^+ \qquad pKa_1 = 10.32$$

$$Ca^{2+} + CO_3^{2-} \rightleftharpoons CaCO_3^+ \qquad pKs = 8.42$$



A partir del DLC homogeneo:

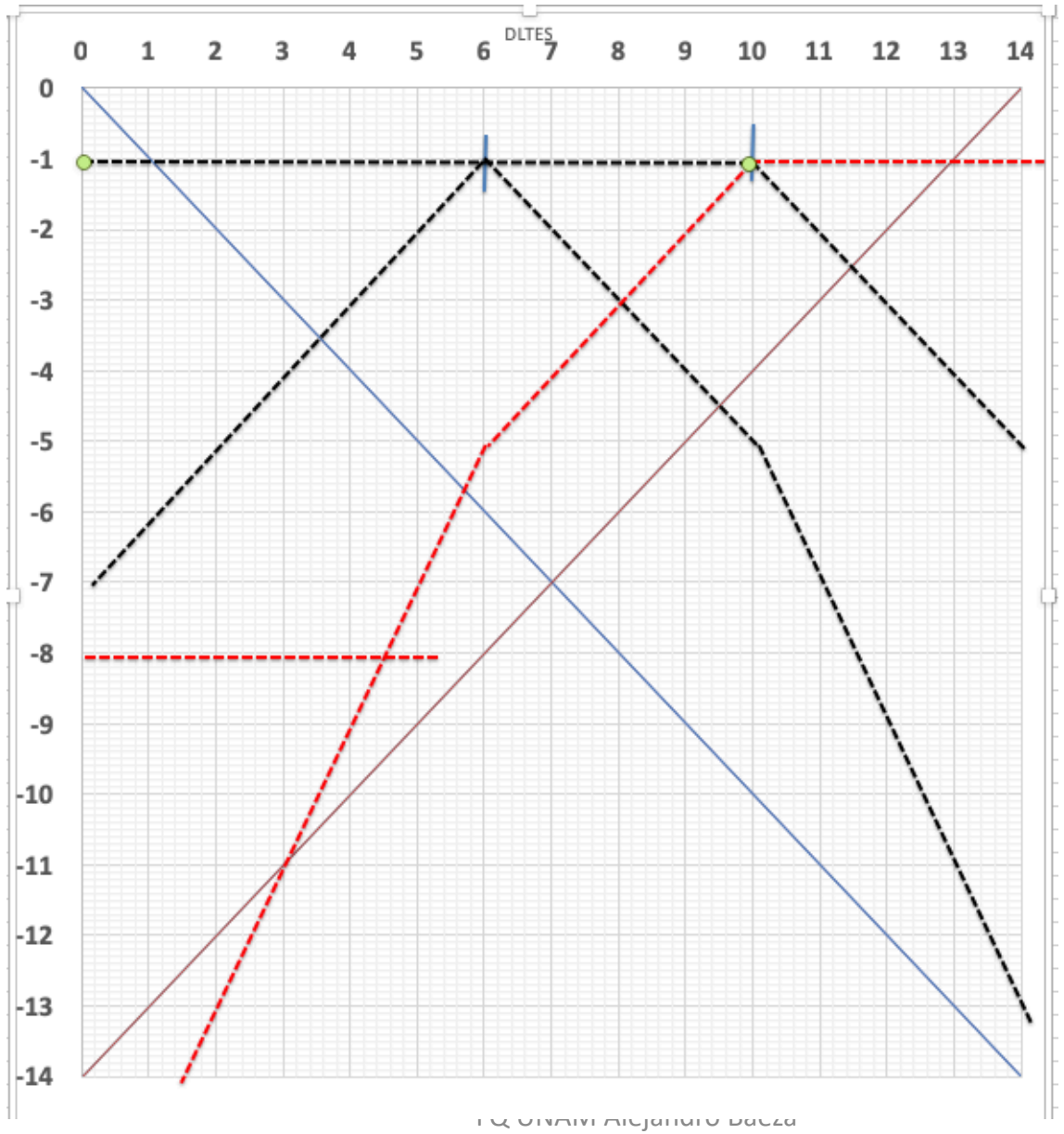


Del Ks del carbonato de calcio:

$Ks = (Ca^{2+})(CO_3^{2-}) = 10^{-8}$; a pCa = 0;

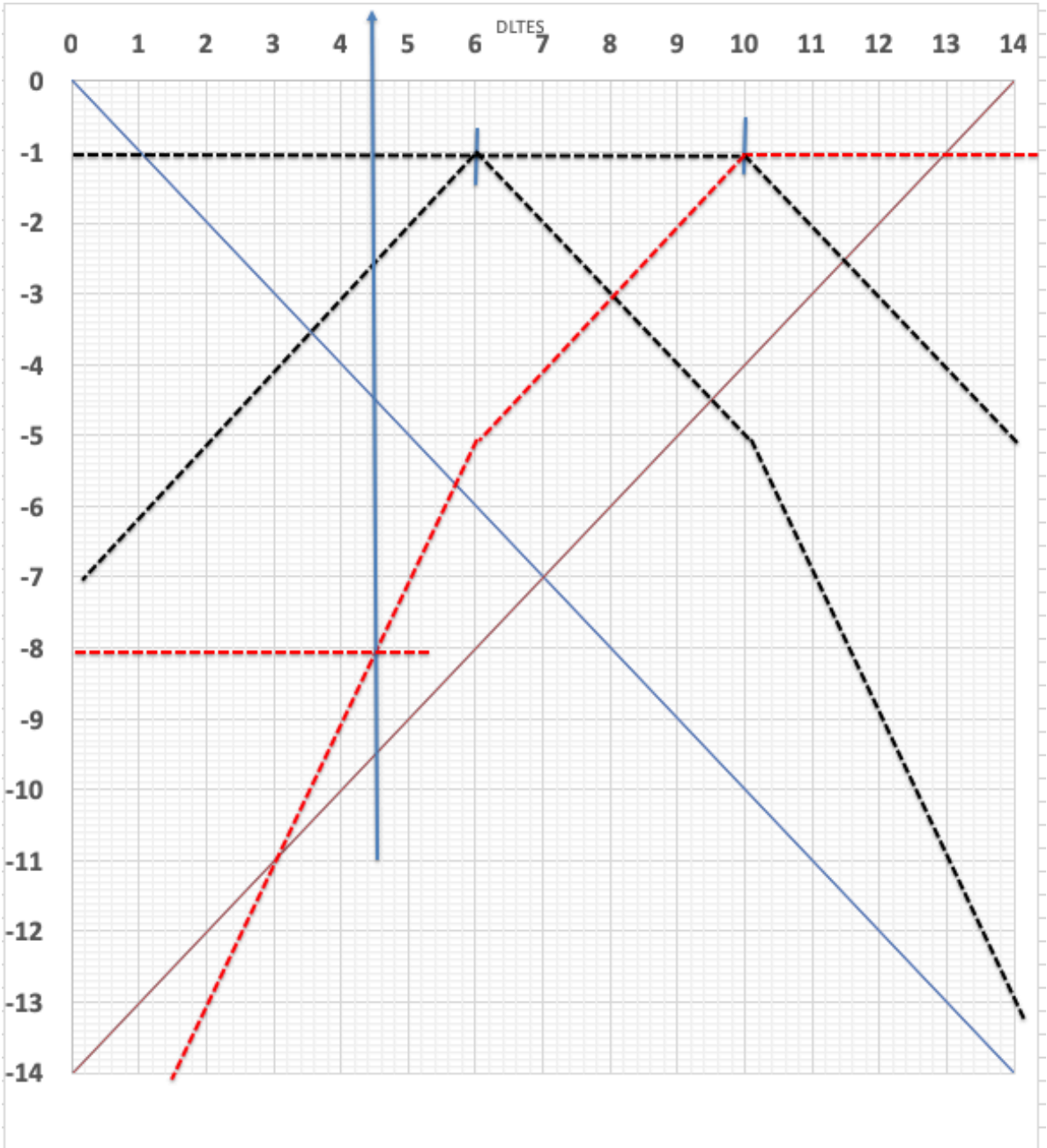
$\log (CO_3^{2-})$ = -8, *ergo*:

$\log (CO_3^{2-}) = -8$

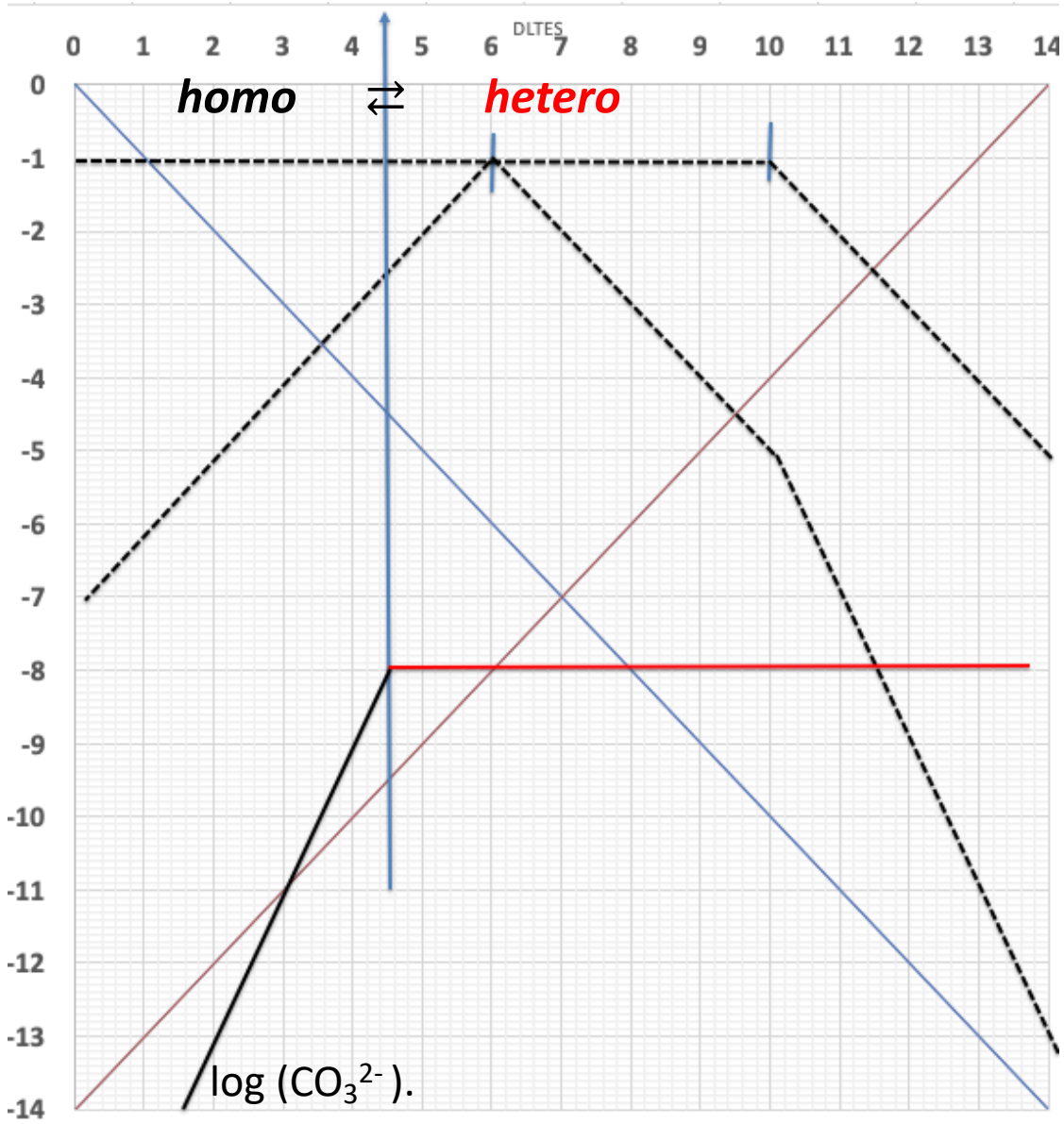


SE DETERMINA EL ***pH***
transición de estado

homo ⇄ ***hetero***

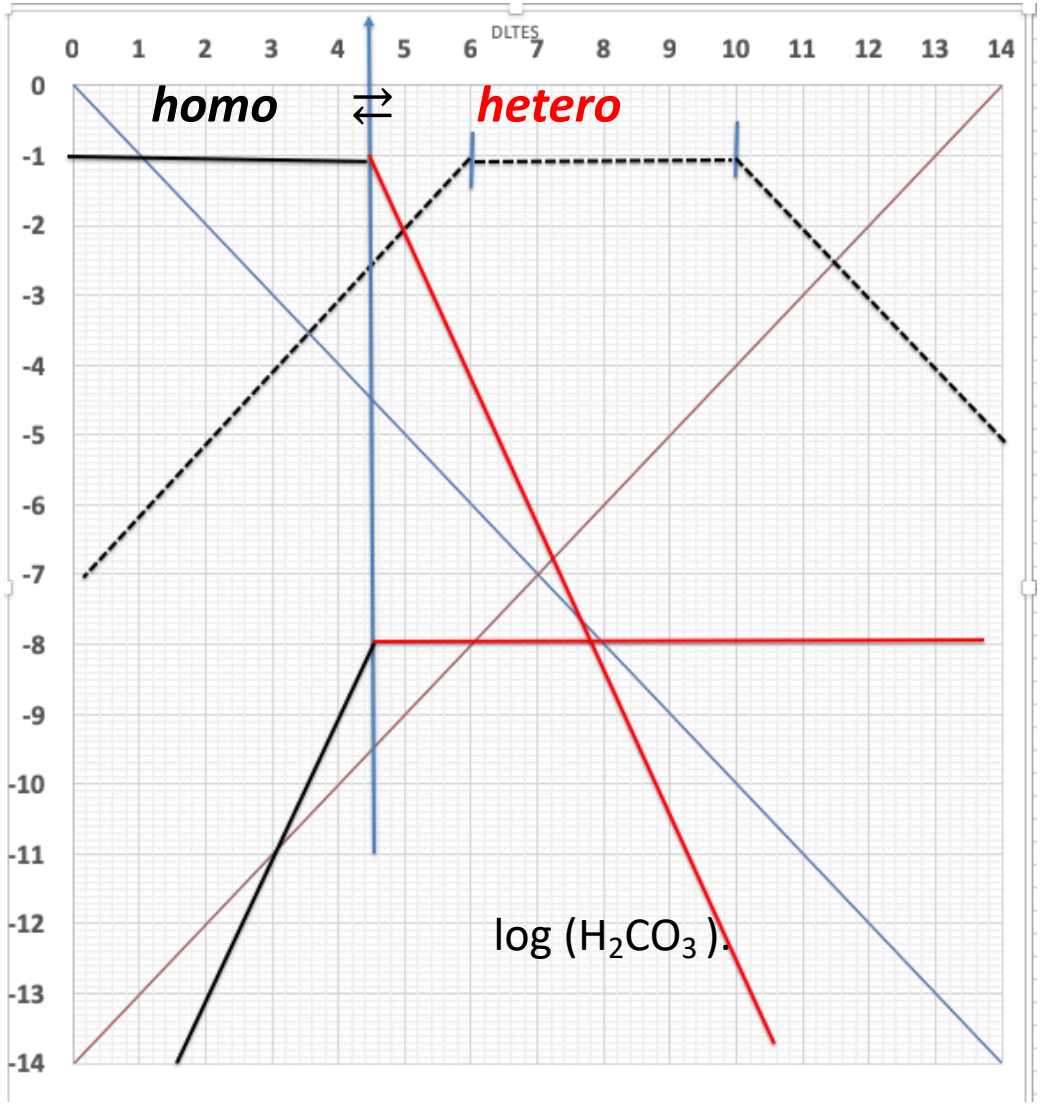


Se traza log (CO_3^{2-}) en ambos estados.



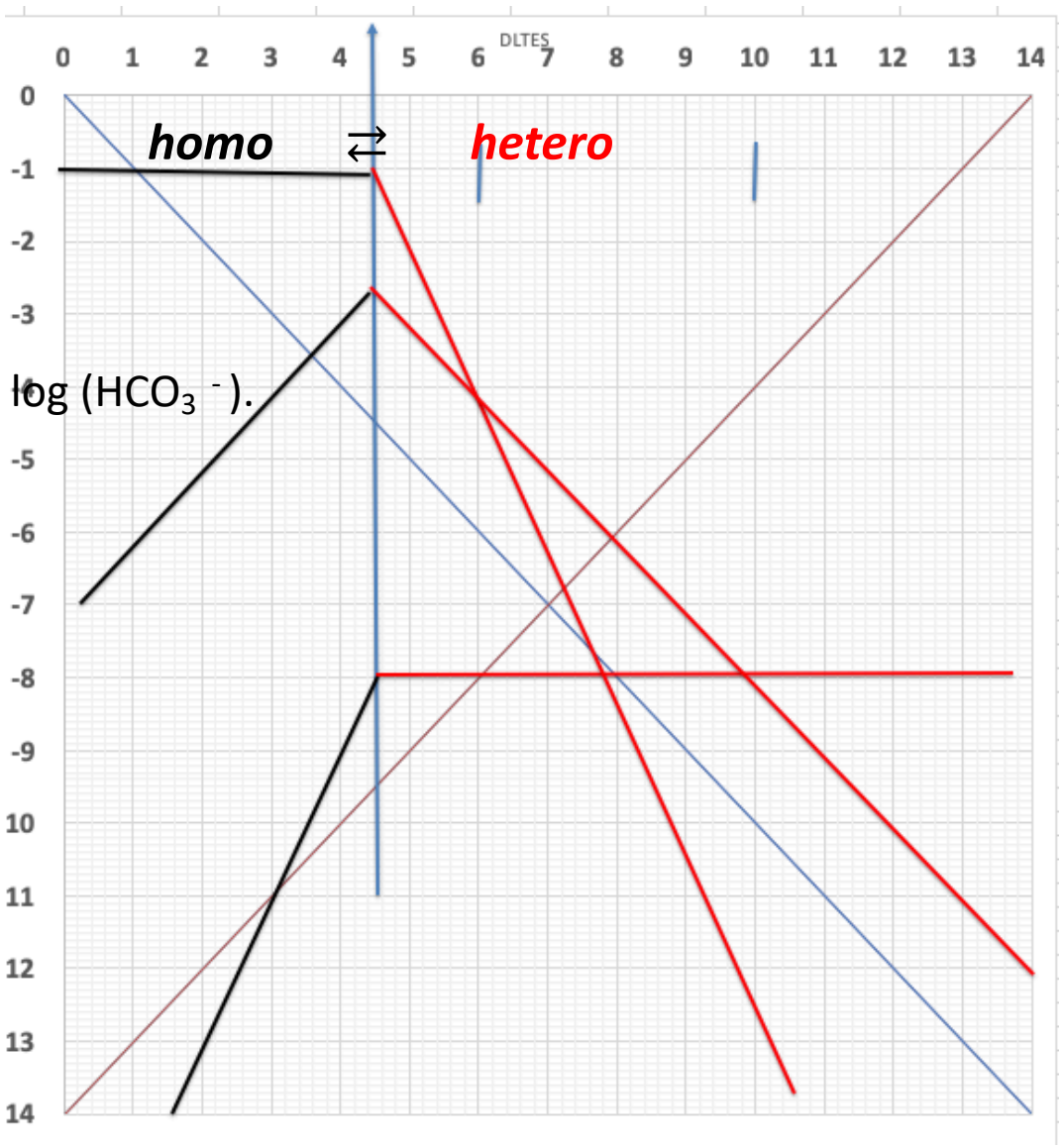
Ahora para log (H_2CO_3) en medio heterogeneo: $H_2CO_3 + Ca^{2+} \rightleftarrows CaCO_3\downarrow + 2H^+$

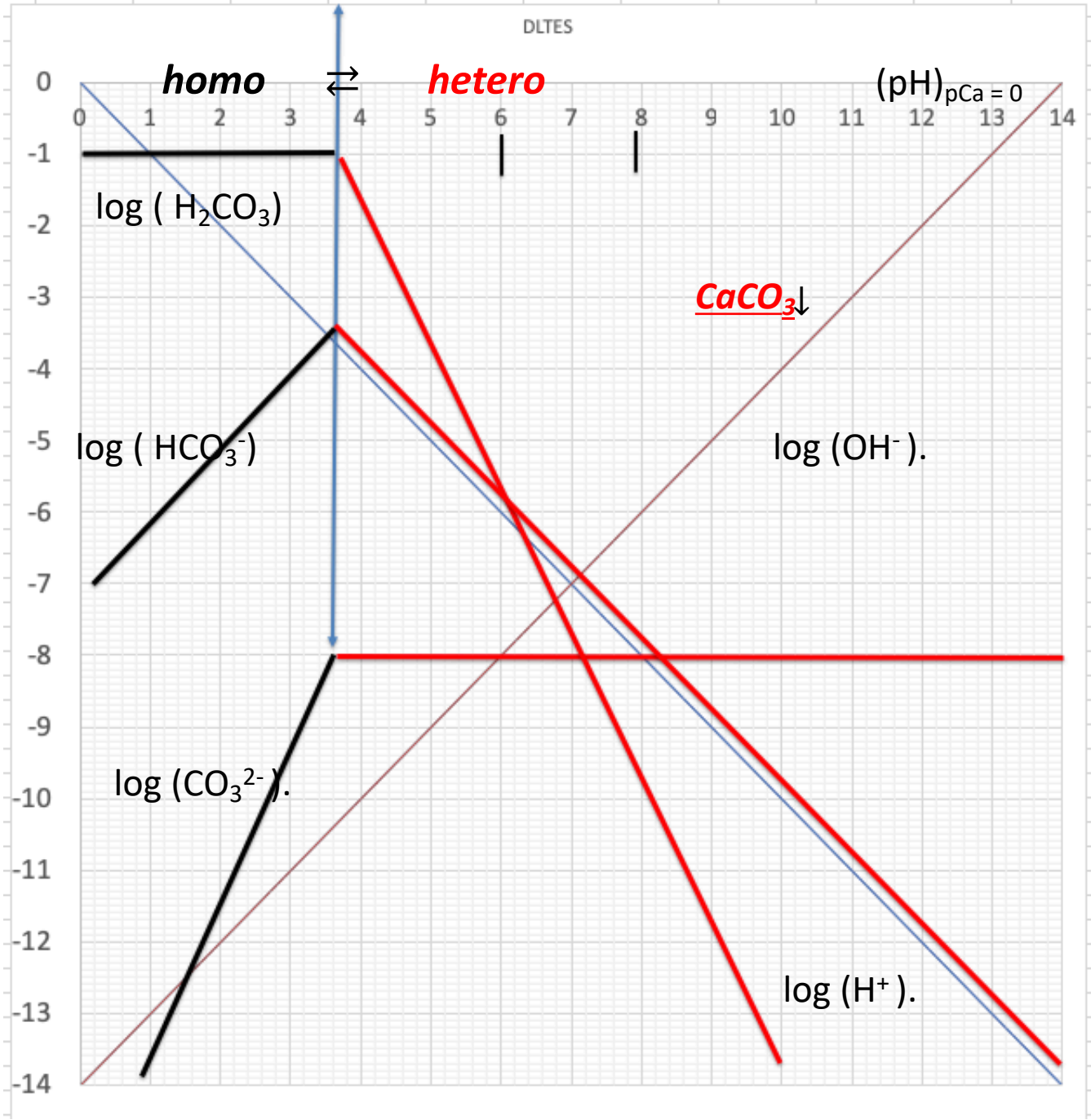
log (H_2CO_3) = pK_{glb} -2pH, ergo:



Ahora para log (HCO_3^-) en medio heterogeneo: $HCO_3^- + Ca^{2+} \rightleftarrows^{+} + CaCO_3\downarrow + H^+$

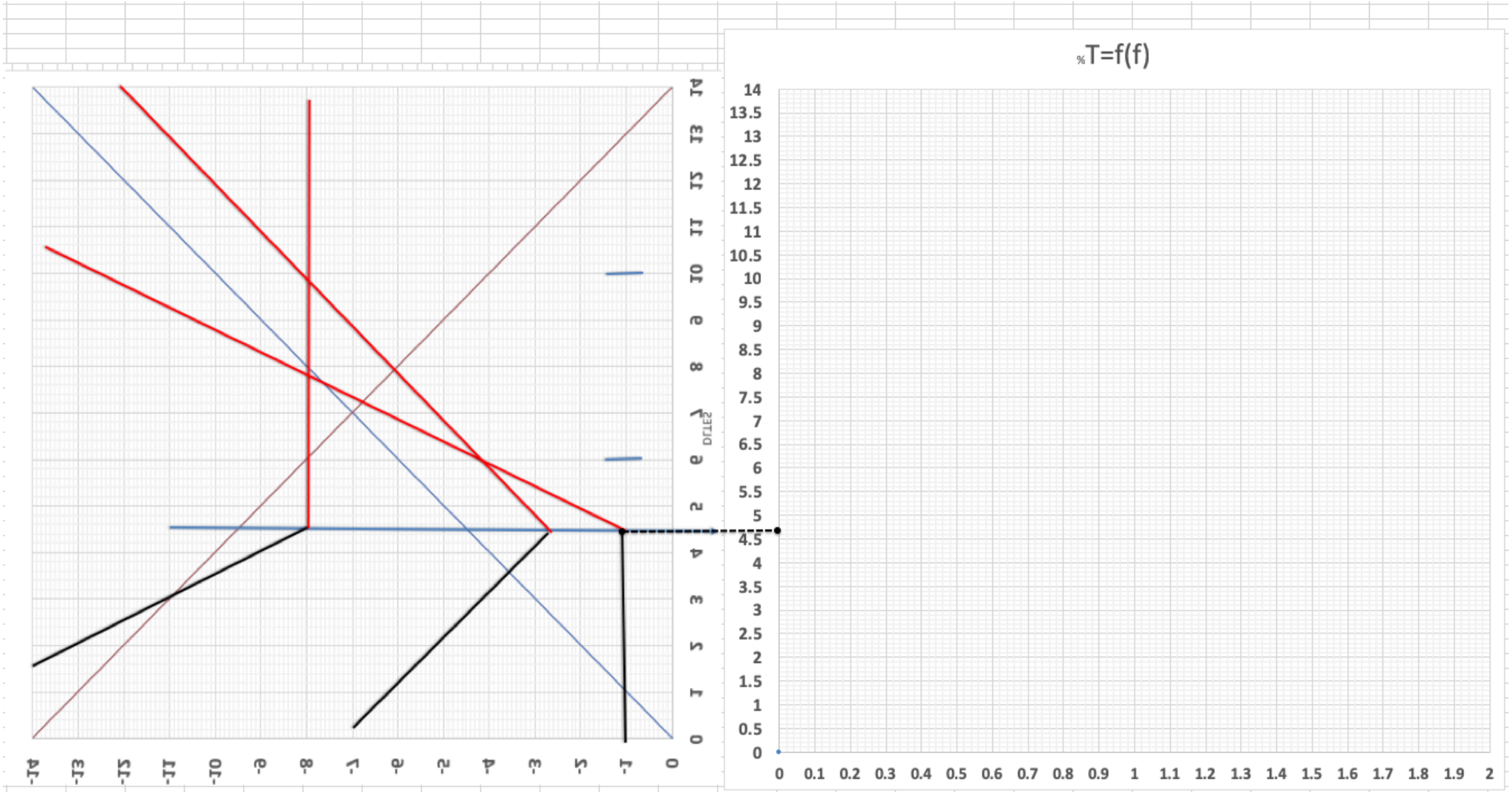
log (HCO_3^-) = pK_{glb} -pH, ergo:




DLTES
homo
⇄
hetero
(pH)pCa = 0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
0 -1 -2 -3 -4 -5 -6 -7 -8 -9 -10 -11 -12 -13 -14
log (H2CO3)
CaCO3↓
log (HCO3-)
log (OH-).
log (CO32-).
log (H+).

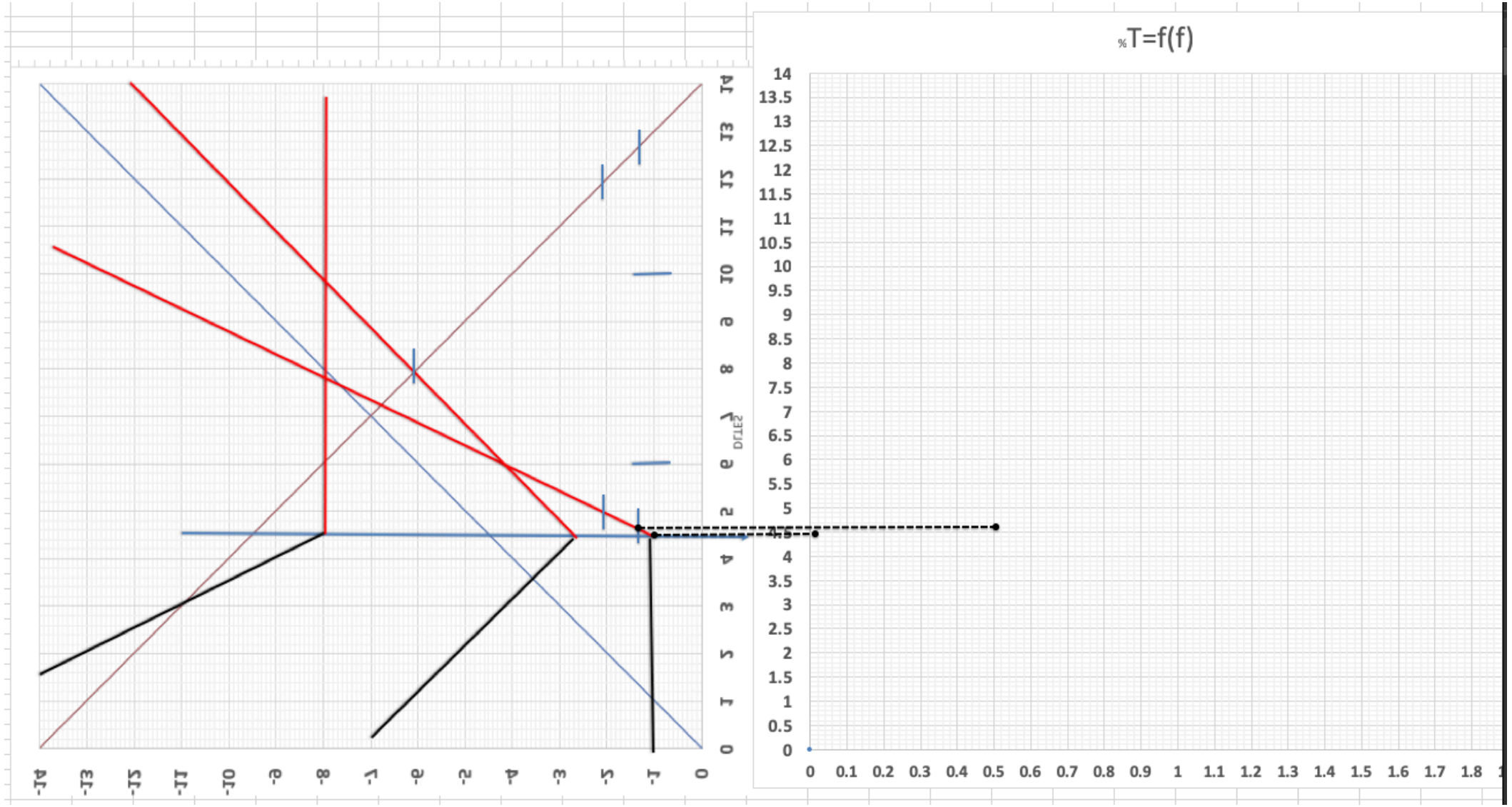
DLTES acoplado = f(*f*) ; (CO_2)´+ NaOH

$f \approx 0$, pH inicio de p.p.



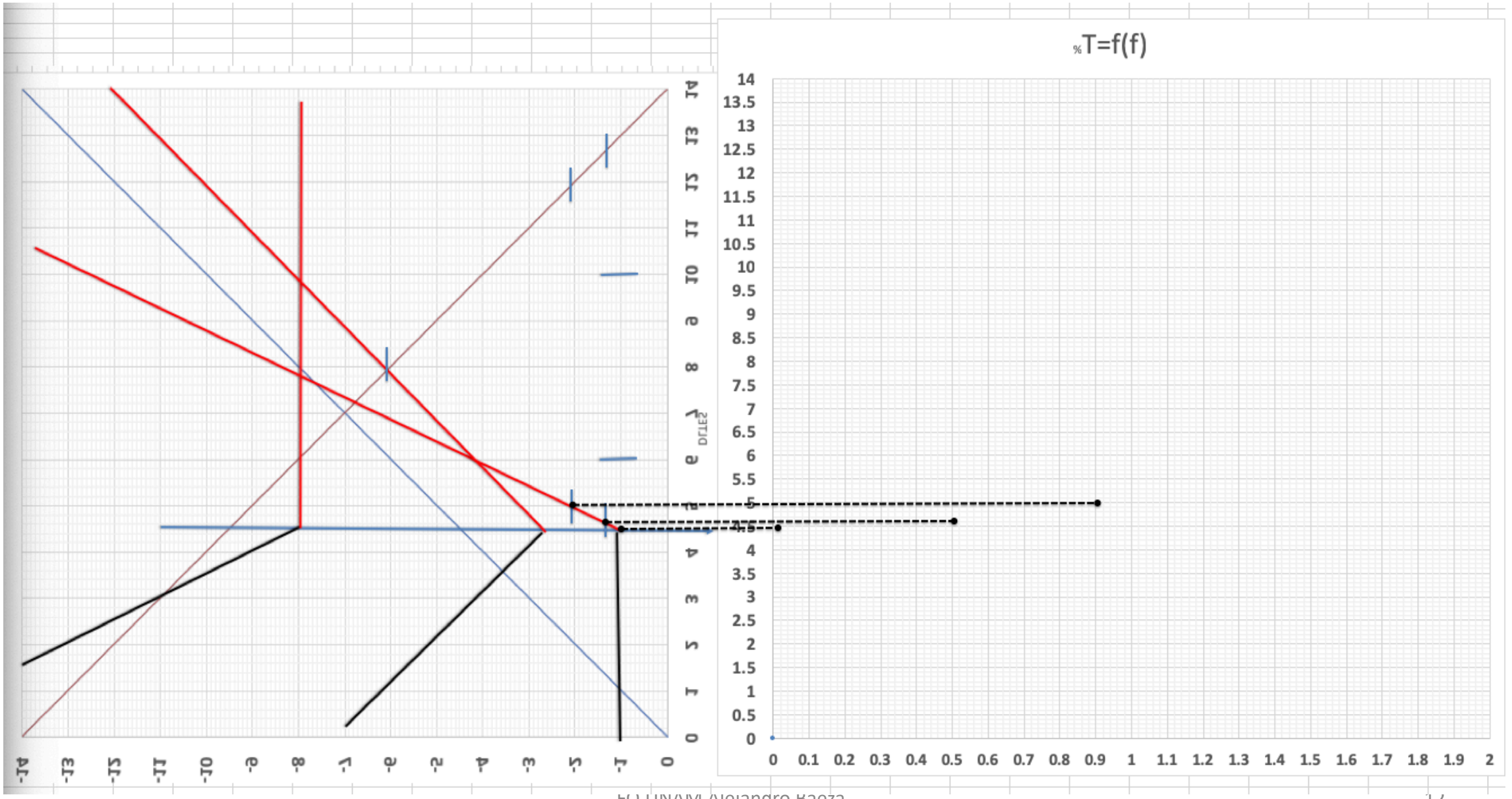
DLTES acoplado = f(*f*) ; (CO_2)´+ NaOH

$f \approx 0.5(2)$, 50%; log Co -0.3:



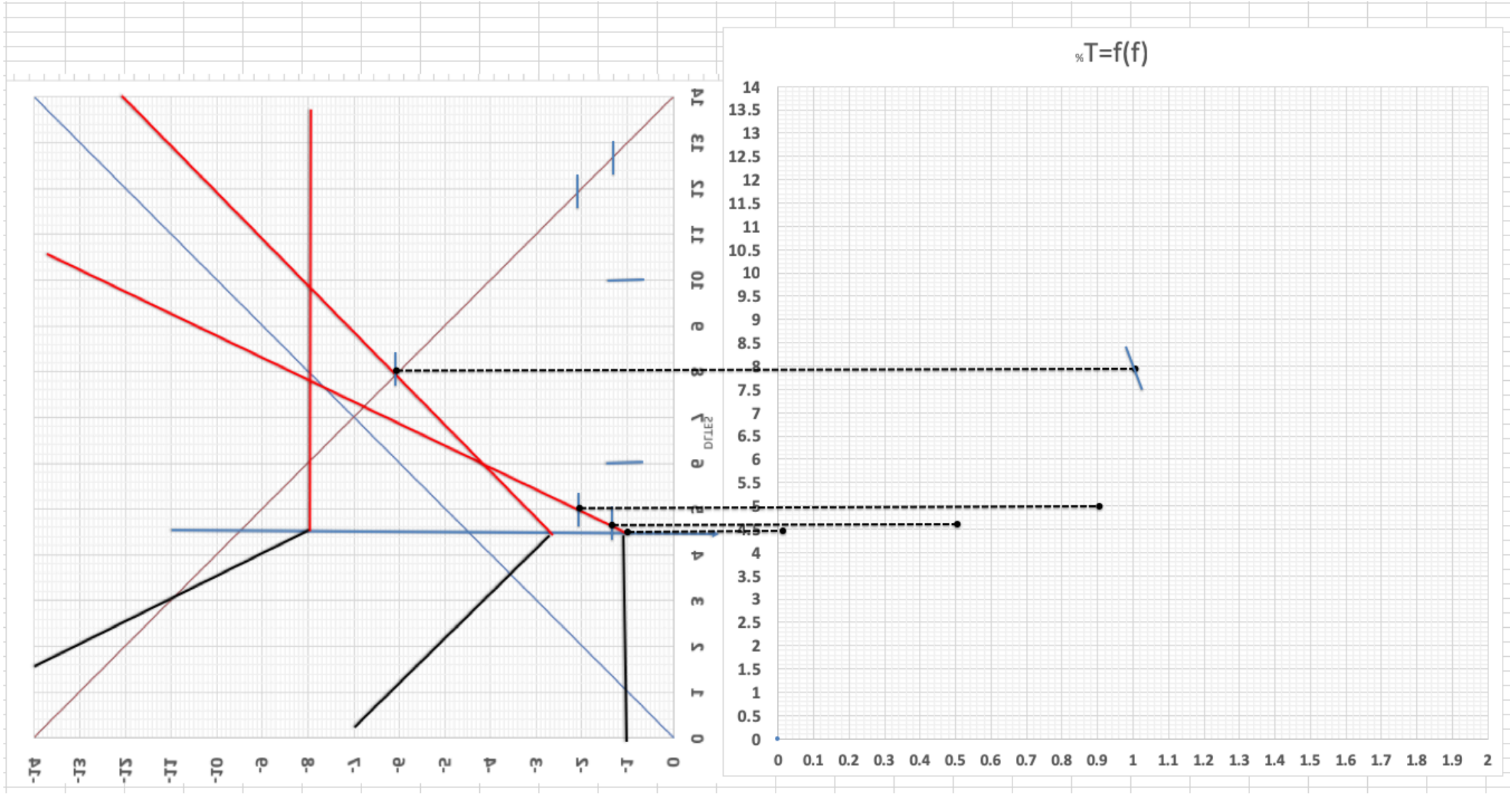
DLTES acoplado = f(*f*) ; (CO_2)´+ NaOH

$f \approx 0.9(2)$, 90%; log Co -1:



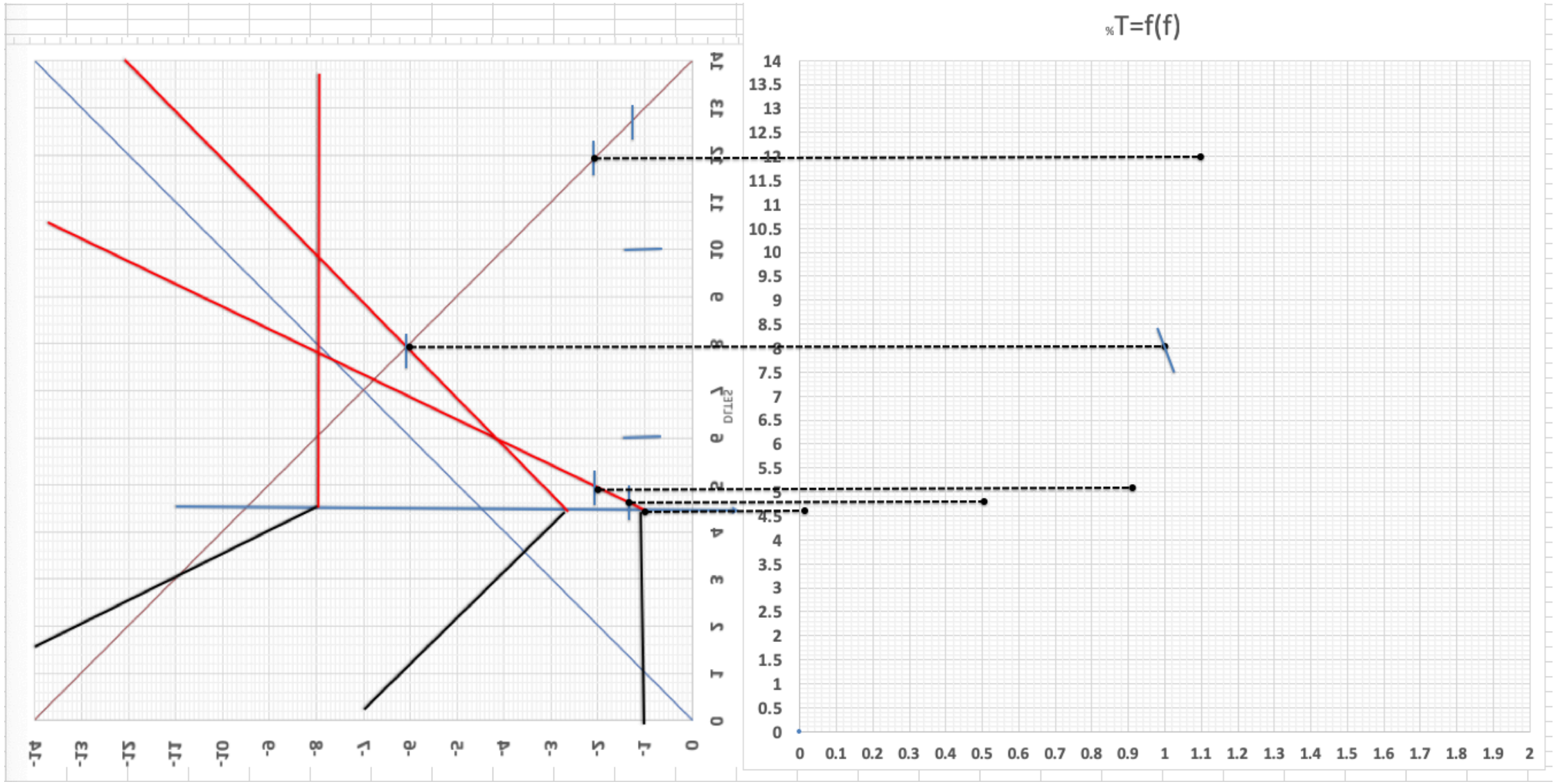
DLTES acoplado = f(*f*) ; $(CO_2)'$+ NaOH

$f \approx 1(2)$, 100%



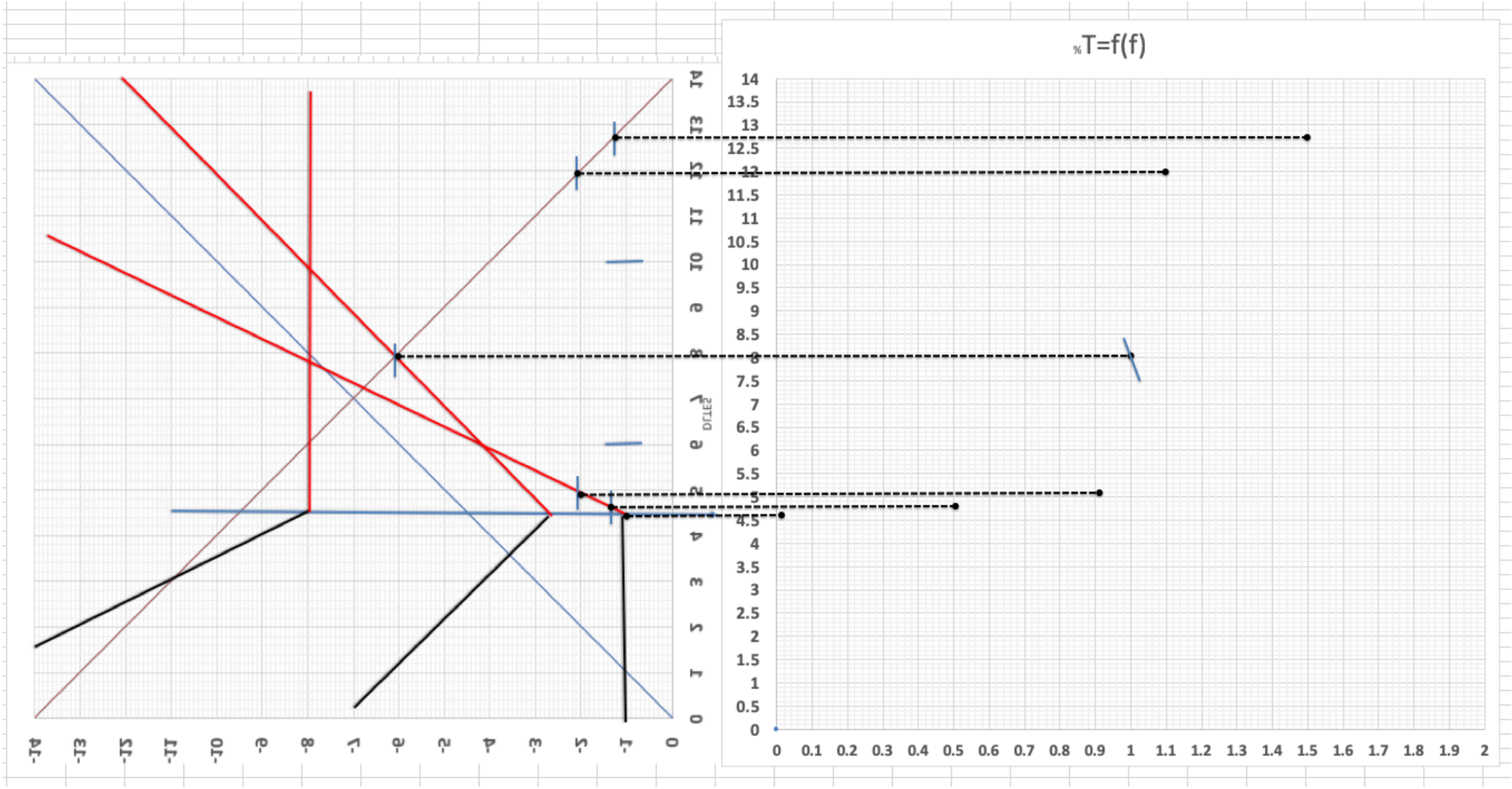
DLTES acoplado = f(*f*) ; $(CO_2)'$+ NaOH

$f \approx 1.1(2)$, 110%log Co -1 = log (OH^-):



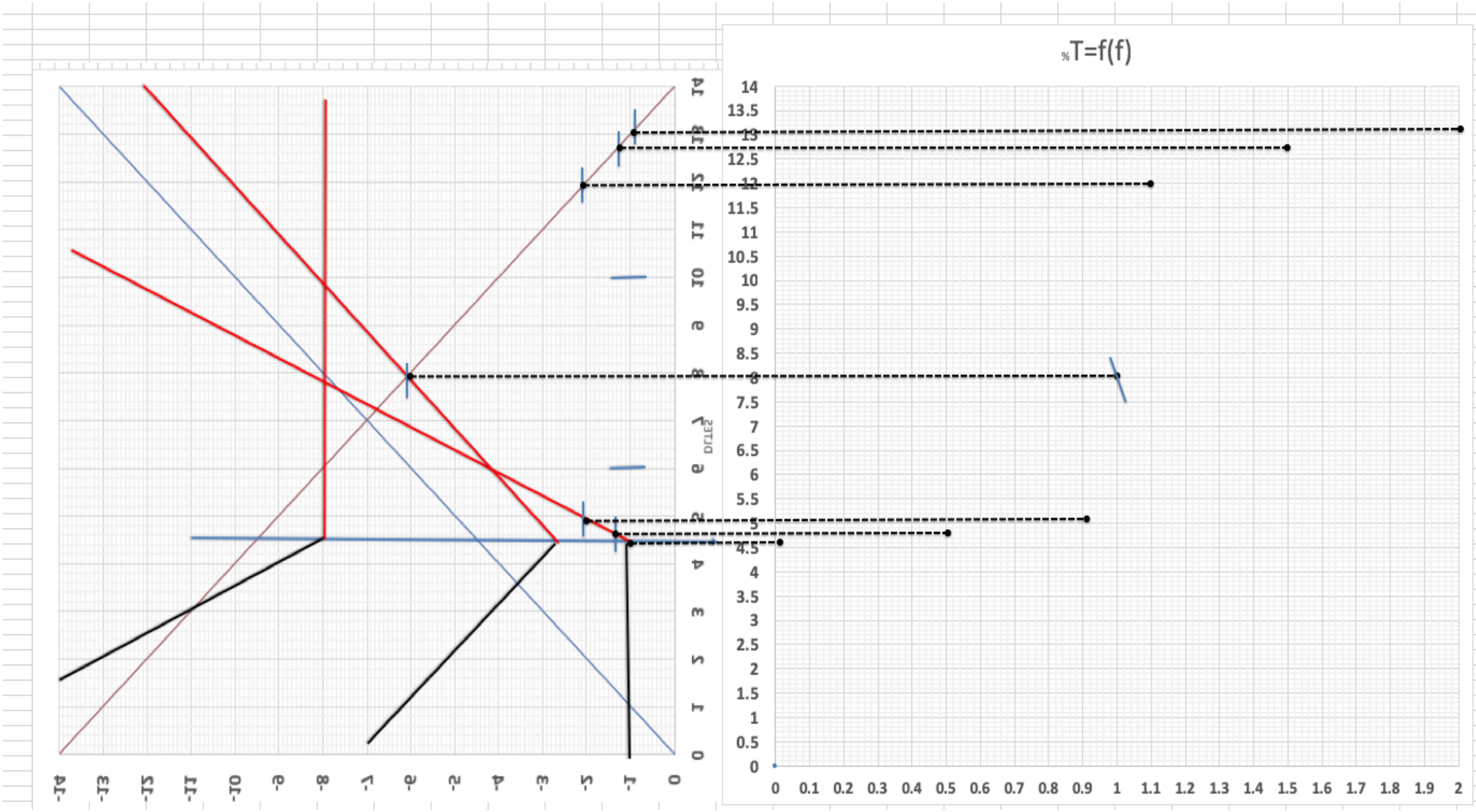
DLTES acoplado = f(*f*) ; $(CO_2)'$+ NaOH

$f \approx 1.5(2)$, 150%log Co -0.3 = log (OH^-):



DLTES acoplado = f(*f*) ; $(CO_2)'$+ NaOH

$f \approx 2(2)$, 200%log Co = log (OH^-):



DLTES acoplado = f(*f*) ; (CO_2)´+ NaOH

q% = $(1-10^{-5})$ = 99.9990%