

[TP] At 25 °C, K_{sp} of CaF_2 3.9×10^{-11} . What is the maximum number of moles of CaF_2 that can dissolve in water at 25 °C?

17% 1. 0.002
17% 2. 0.01
17% 3. 0.0002
17% 4. 0.001
17% 5. 0.00002
17% 6. 0.0001

Response Counter

10

Lecture 22 CH102 A1 (MWF 9:05 am)

Wednesday, March 22, 2017

See Overview of acid-base calculations, https://goo.gl/GEPDqo

- More practice
- $[H_3O^+]$ when different amounts of "not enough" base added: Buffer action

Next lecture: Ch15: Solubility, precipitation, and complexation

[TP] At 25 °C, 0.10 mol each of a weak acid HA, a strong acid HB, and OH^- are combined in 1.0 L of water. The pH of the solution is …

25% 1. < 7
25% 2. = 7
25% 3. > 7
25% 4. Further information needed

Response Counter

10

[Quiz] An acid HA has $K_a = 1.0 \times 10^{-4}$ at 25 °C. An aqueous solution is made by combining of 0.137 moles each of HA and A^- in a total volume of 250 mL at 25 °C. The pH of the solution is …

17% 1. 1
17% 2. 4
17% 3. 7
17% 4. 10
17% 5. 13
17% 6. More information needed

Different amounts of "not enough" base

At 25 °C, the pH of a 1.0 L solution of $c_a = c_b = 1.00$ M, $K_a = 1 \times 10^{-5}$ is ...

pH = 5.00

Add 100. mL of 0.100 M NaOH ...

↓HA(*aq*) + OH^-(*aq*) → H_2O(*l*) + ↑A^-(*aq*)

HA → 1.00 mol – 0.010 mol = 0.99 mol

A^- → 1.00 mol + 0.010 mol = 1.01 mol

The pH of a 1.0 L solution of c_a = 0.99 mol/1.10 L, c_b = 1.01 mol/1.10 L is ...

c_a/c_b = 1.00 → 0.99/1.01, pH → 5.01 (tiny change!)

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Different amounts of "not enough" base

At 25 °C, the pH of a 1.0 L solution pure water, $K_a = 1 \times 10^{-14}$ is ...

pH = 7.00

Add 100. mL of 0.100 M NaOH ...

$[OH^-]$ = 0.010 mol/1.10 L = 0.0091

pOH = 2.04, pH = 11.96 (huge change!)

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Different amounts of "not enough" base

At 25 °C, the pH of a 1.0 L solution of $c_a = c_b = 1.00$ M, $K_a = 1 \times 10^{-5}$ is ...

pH = 5.00

Add 100. mL of 0.100 M HCl ...

HCl(*aq*) + ↓A^-(*aq*) → ↑HA(*aq*) + Cl^-(*aq*)

HA → 1.00 mol + 0.010 mol = 1.01 mol

A^- → 1.00 mol – 0.010 mol = 0.99 mol

The pH of a 1.0 L solution of c_a = 1.01 mol/1.10 L, c_b = 0.99 mol/1.10 L ...

c_a/c_b = 1.00 → 1.01/0.99, pH → 4.99 (tiny change!)

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