

CONCEPT: DETERMINING PREDOMINATE SPECIES

- Recall: Henderson-Hasselbalch reveals ratio of [conjugate base] to [conjugate acid].
 - Conjugate _____ and conjugate _____ are different forms/species of a molecule.
- _____ species: the *most abundant* form of a molecule that exists under specific conditions.
 - _____ of the solution & _____ of the acid dictates the predominate species.

pH vs. pK_a

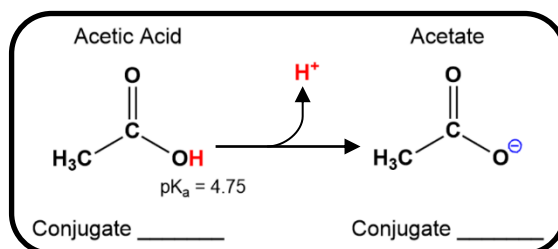
- Comparing solution pH to an acid's pK_a reveals relative [Conjugate _____] & [Conjugate _____].
 - Recall: Conjugate bases are _____ (1 less H) & Conjugate acids are _____ (1 more H).

EXAMPLE: Comparing pH & pK_a to fill-in the blanks.

Comparing pH to pK _a	Predominate Species	Protonated?	Henderson-Hasselbalch Equation: $\text{pH} = \text{pK}_a + \log \frac{[\text{Conjugate Base}]_f}{[\text{Conjugate Acid}]_f}$
pH = pK _a	[Conj-Base] ____ [Conj-Acid]	50% Deprotonated 50% Protonated	pH = pK _a + log _____
pH < pK _a	[Conj-Base] ____ [Conj-Acid]	Majority _____	pH = pK _a + log _____
pH > pK _a	[Conj-Base] ____ [Conj-Acid]	Majority _____	pH = pK _a + log _____

PRACTICE: Fill-in the blanks and indicate the predominate species at pH 8.3.

- Acetic acid.
- Acetate.



PRACTICE: Consider the following pK_a value for pyruvic acid. Which of the following species predominates at pH = 7.4?

- Conjugate base (CB).
- Conjugate acid (CA).
- Neither predominates ([CA] = [CB]).
- Not enough info to tell.

