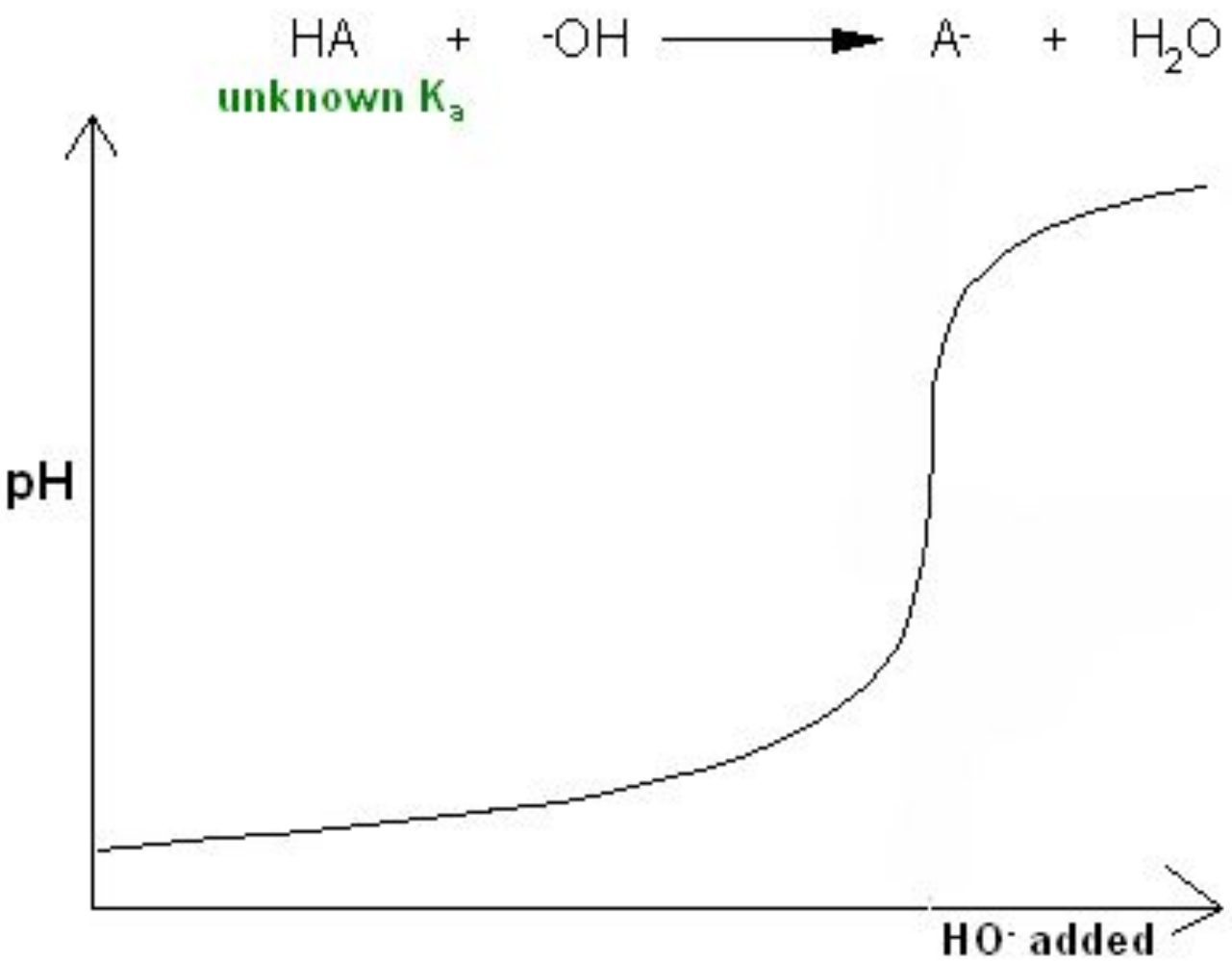
Acid Base Chemistry

1. Foundation knowledge
2. The pH scale
3. The pH of Water
4. Acids
5. Bases
6. Acid base titrations
    a. pH curves and suitable indicators
    b. Using pH curves to find K_a values
7. Relative acidity and basicity – competition for H+

How do you calculate pKa from titration curves?



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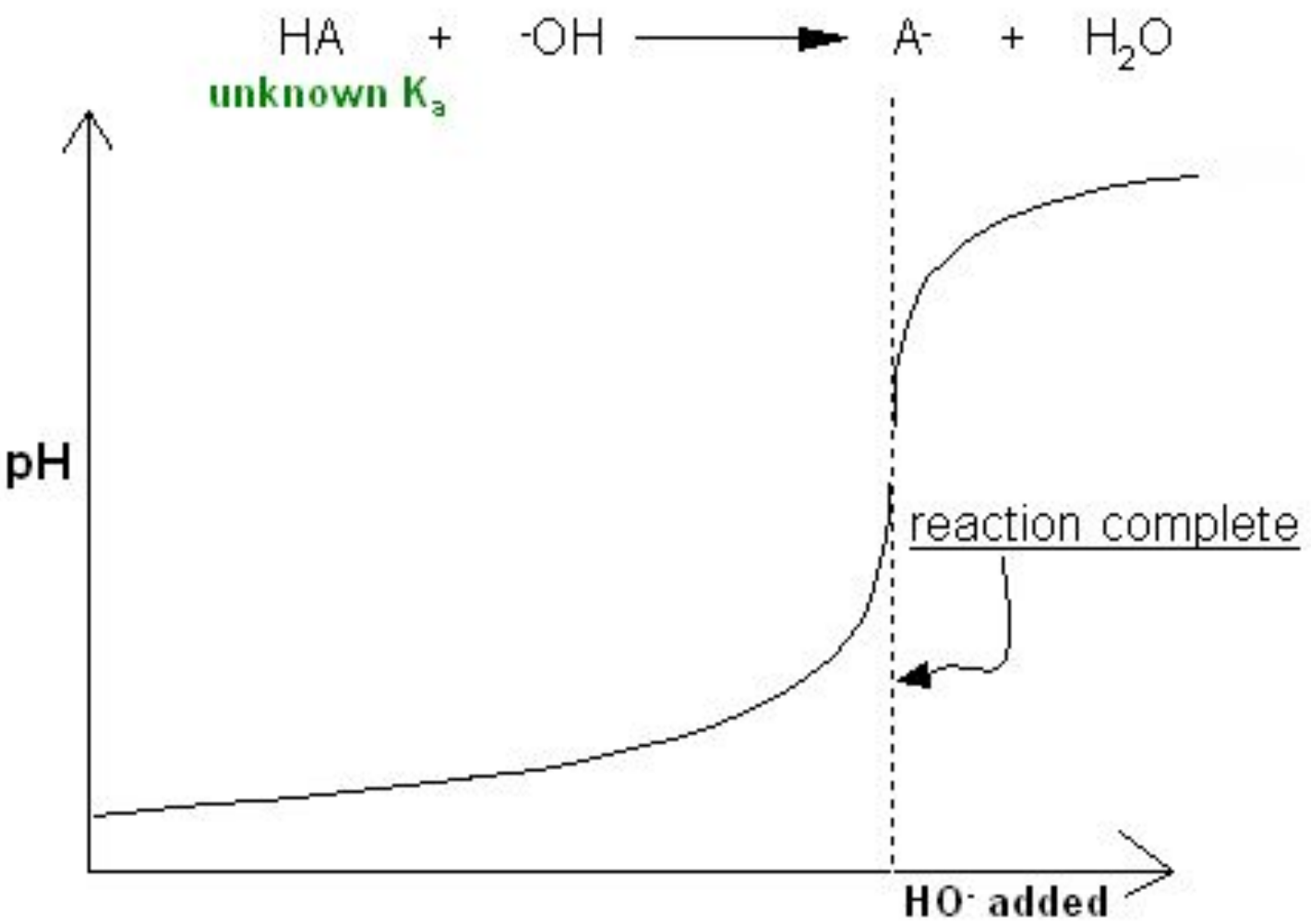

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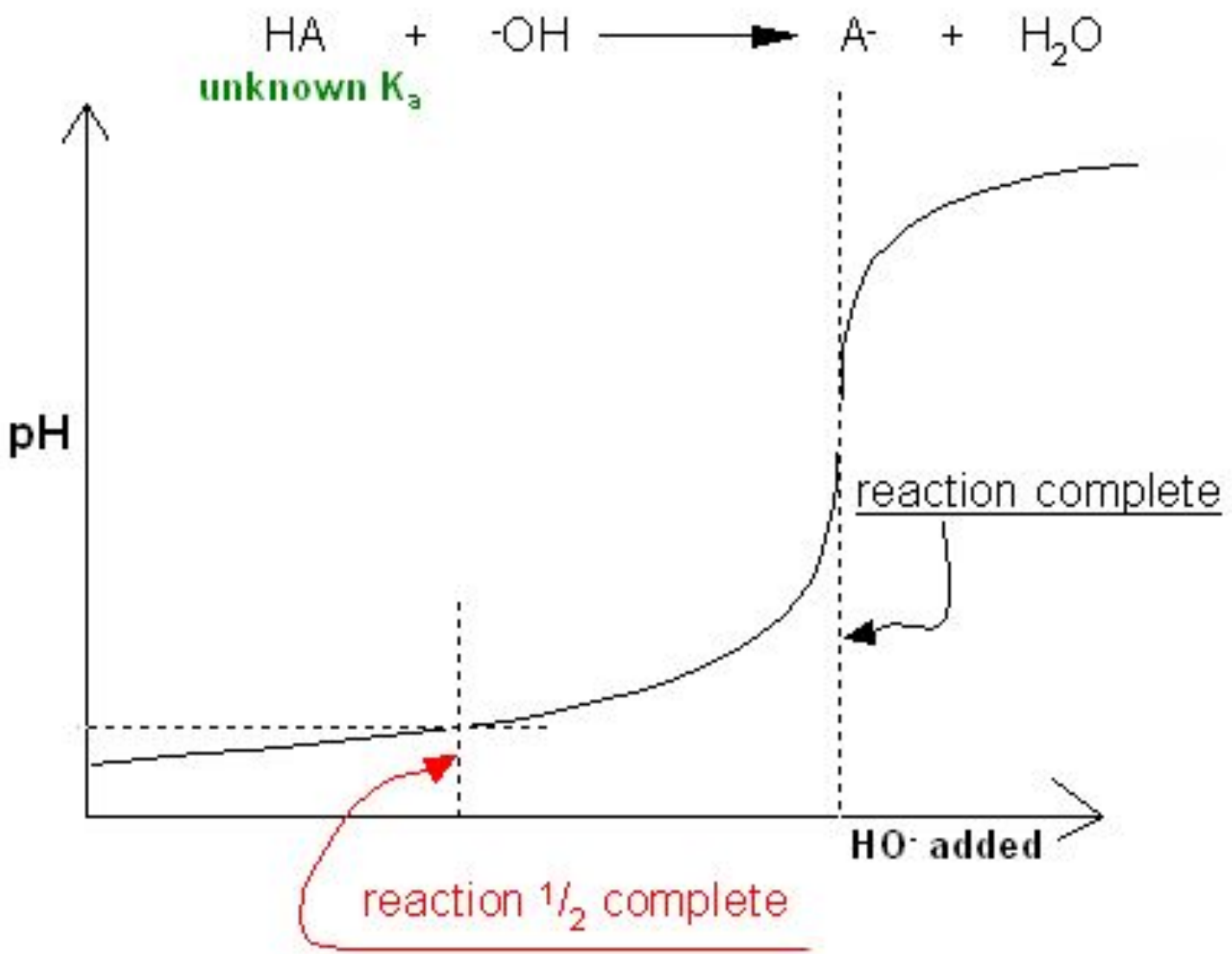

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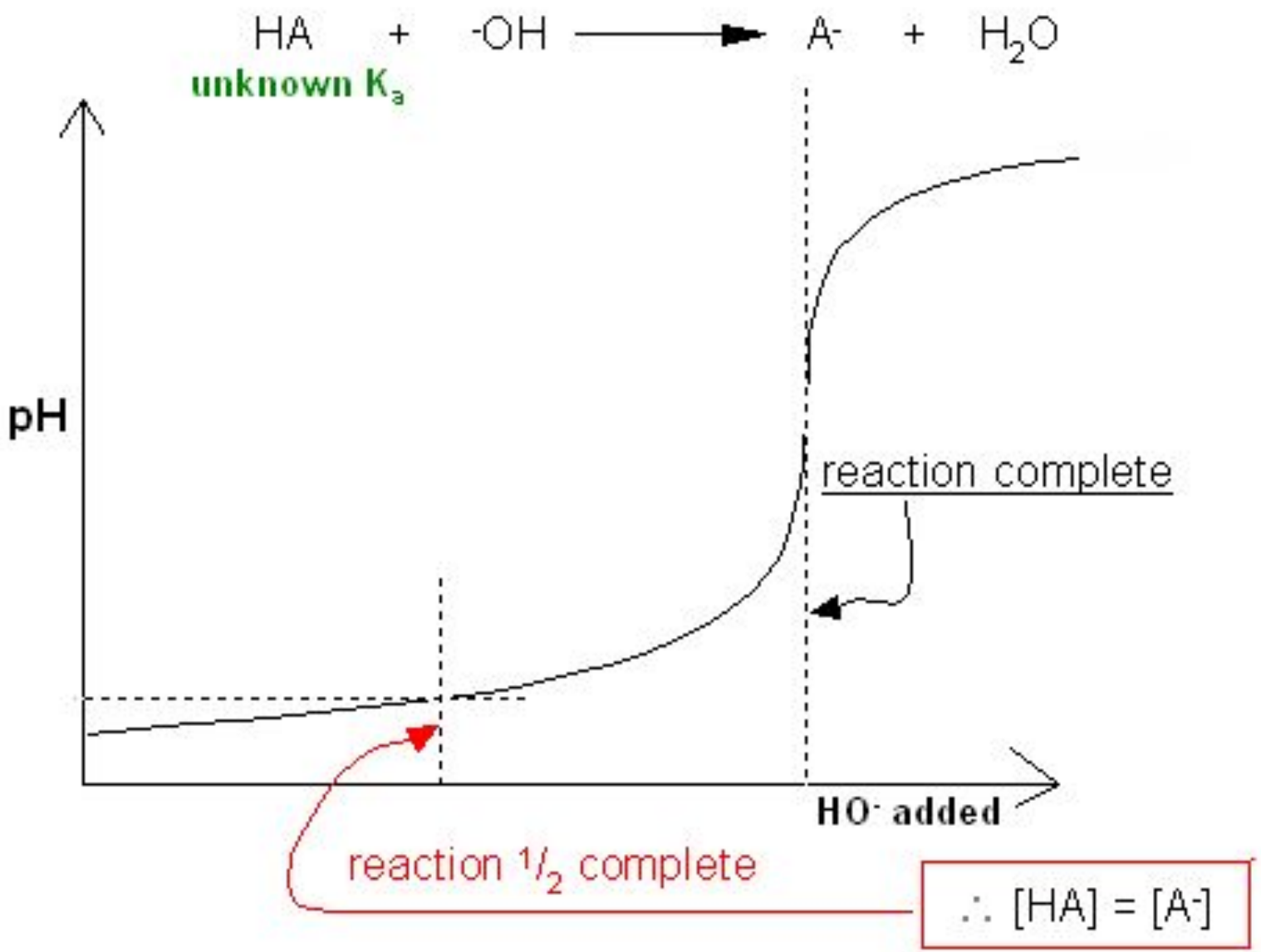

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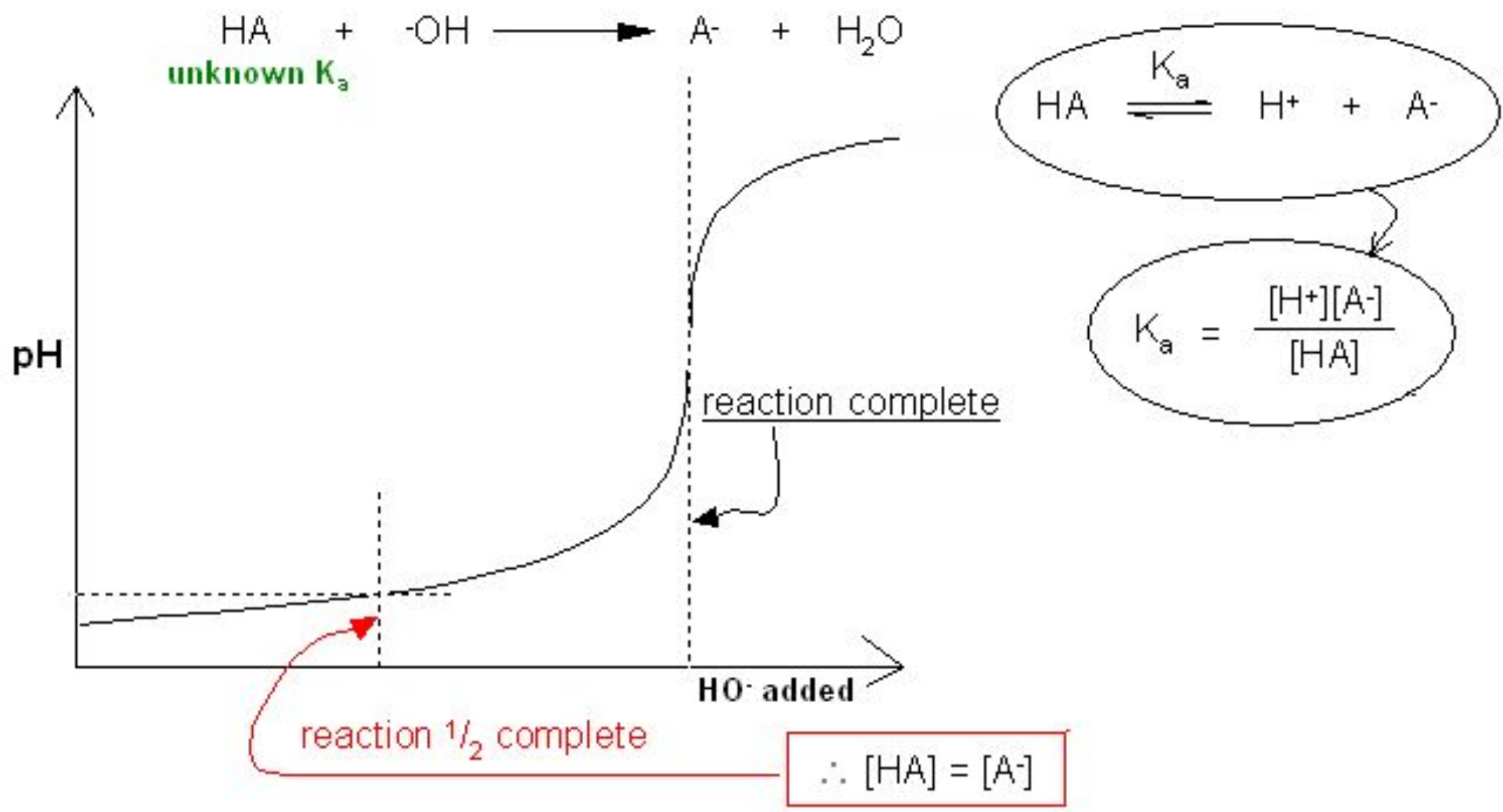

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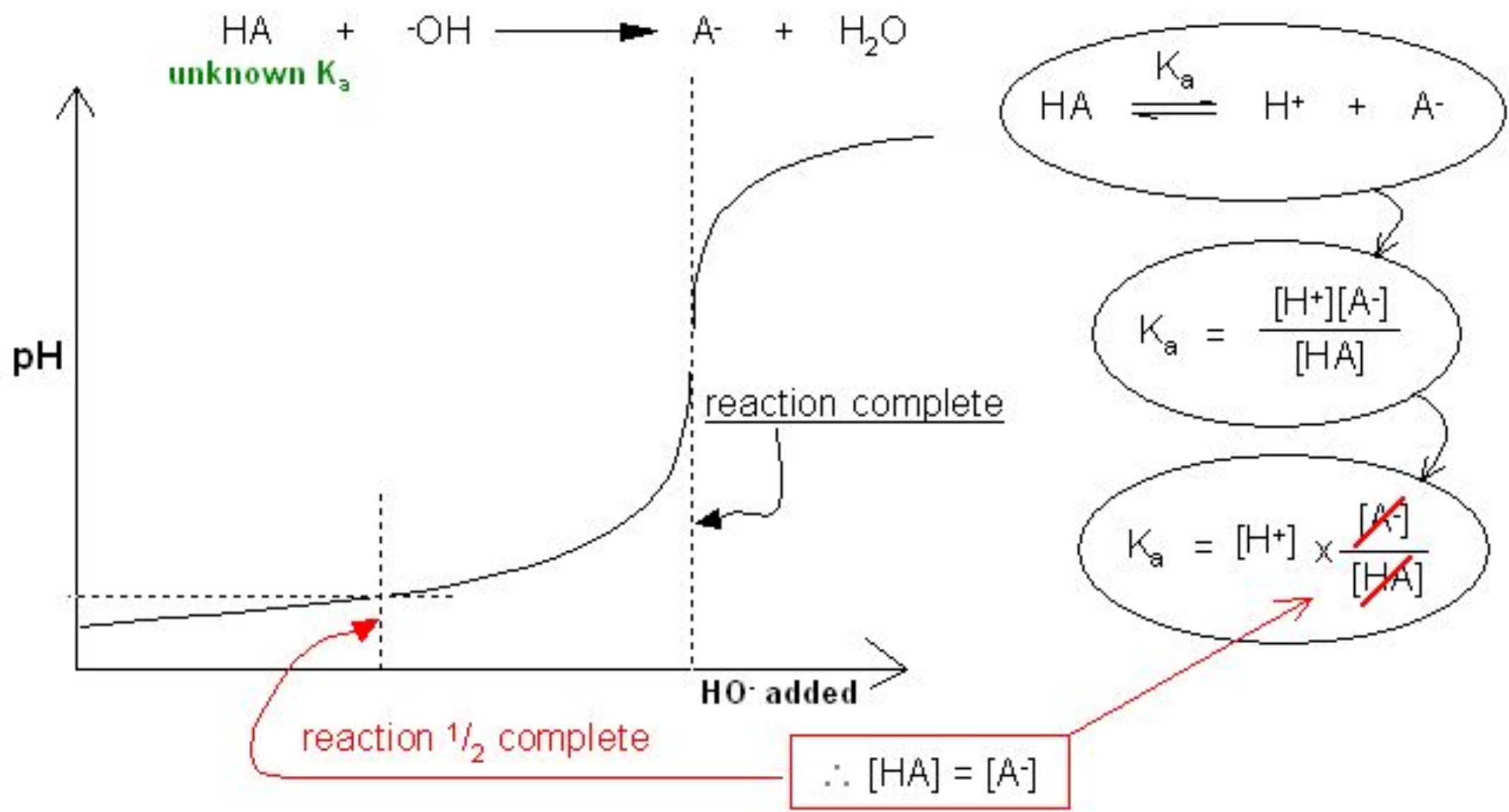

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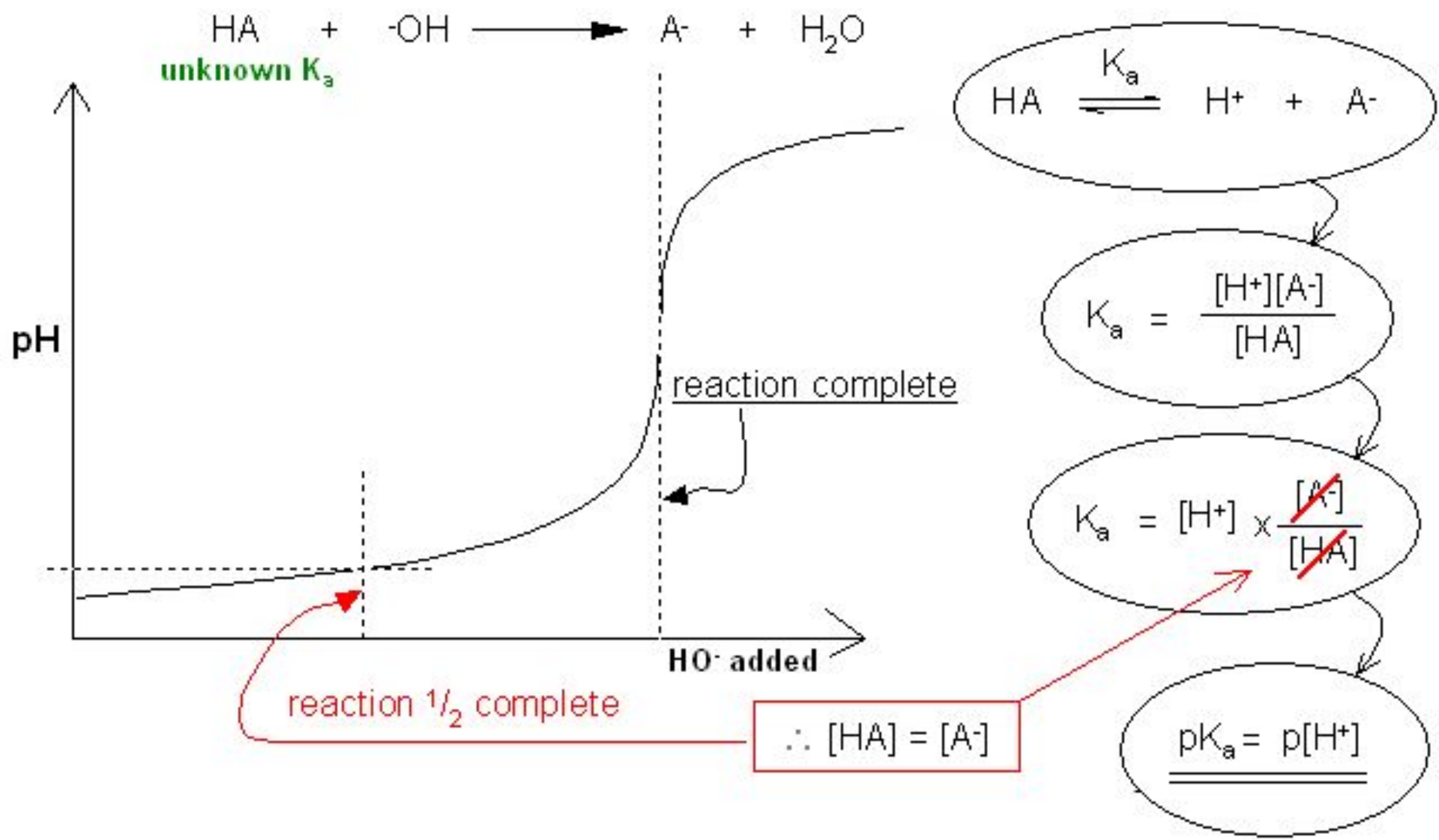

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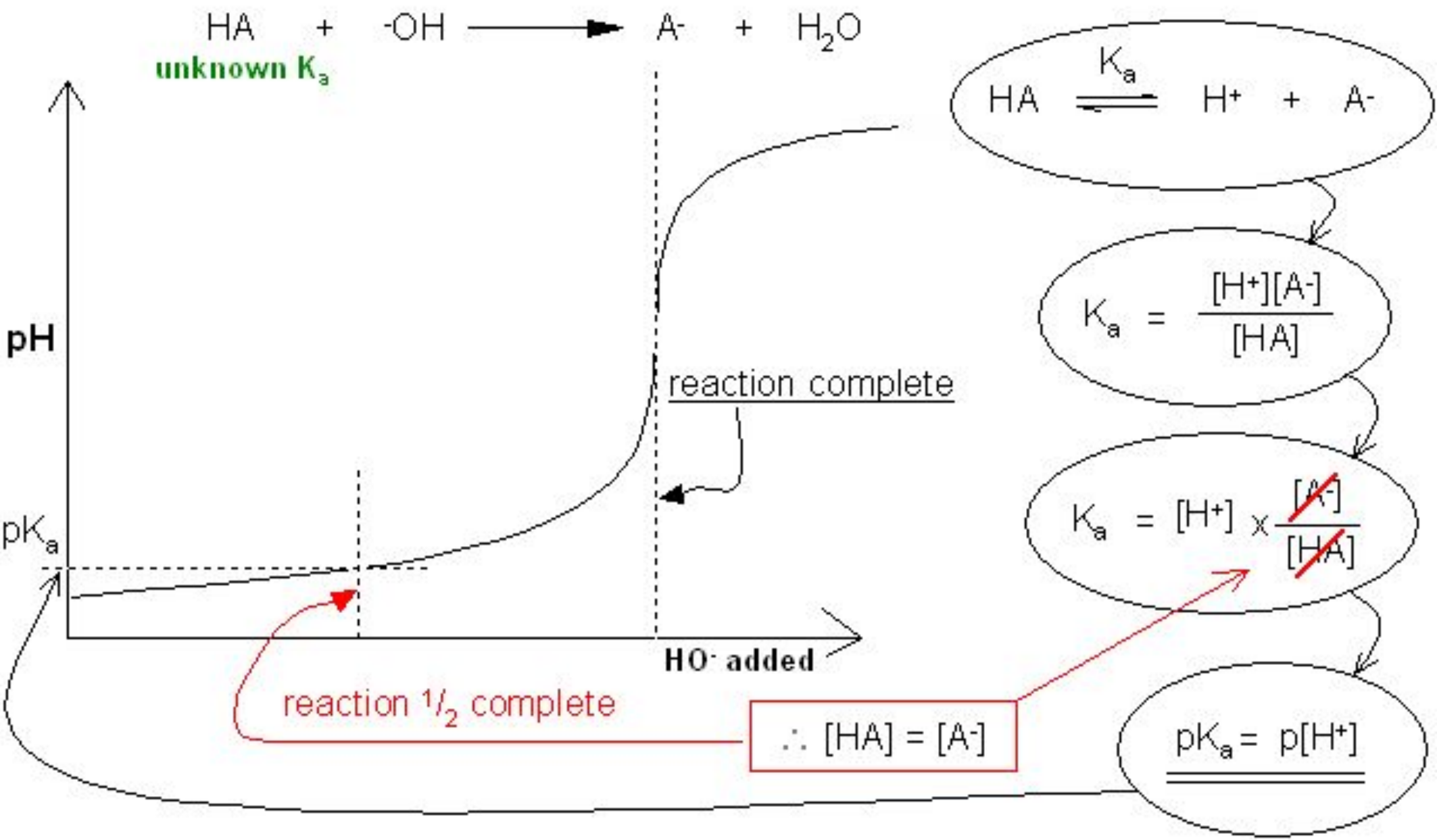

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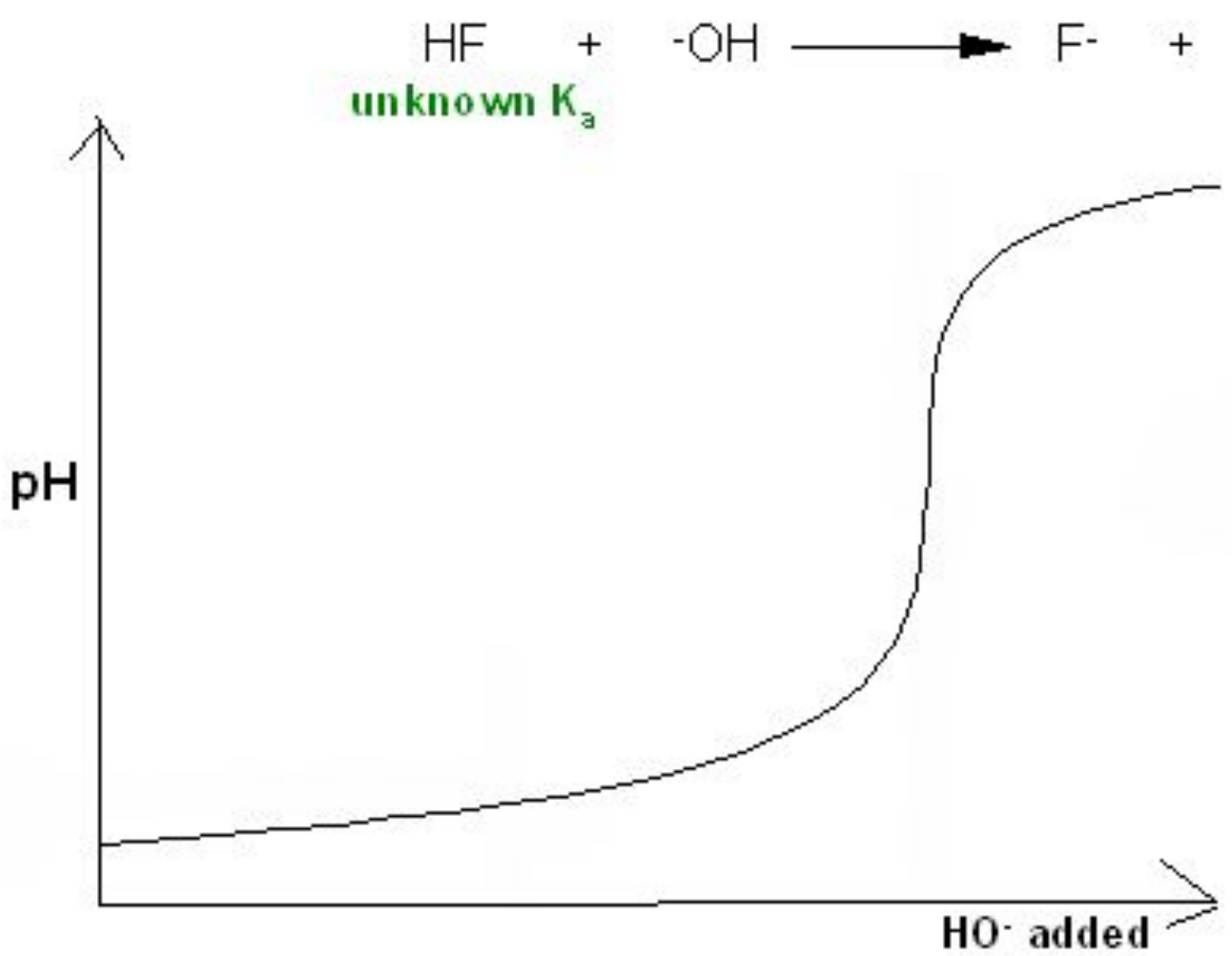

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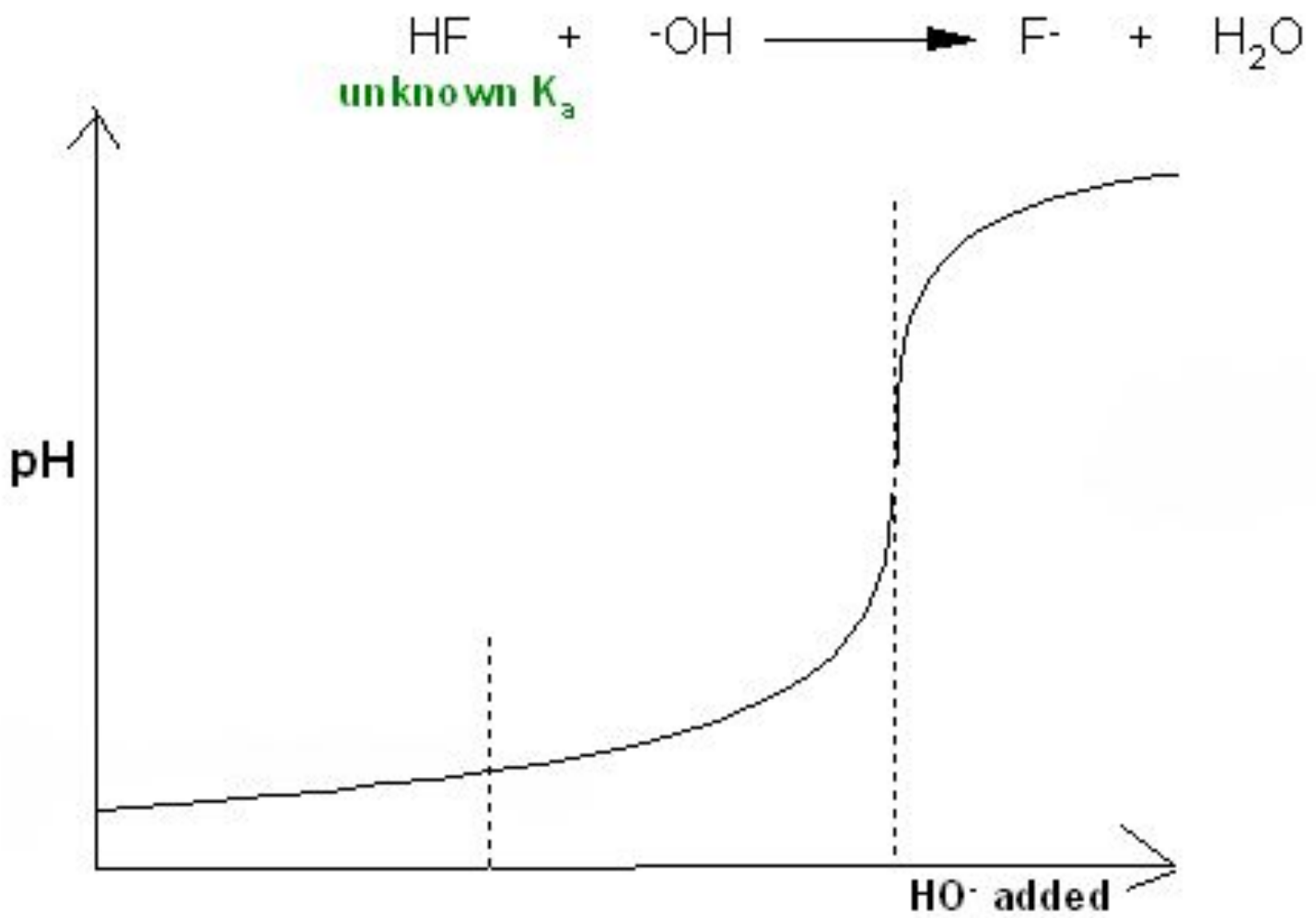

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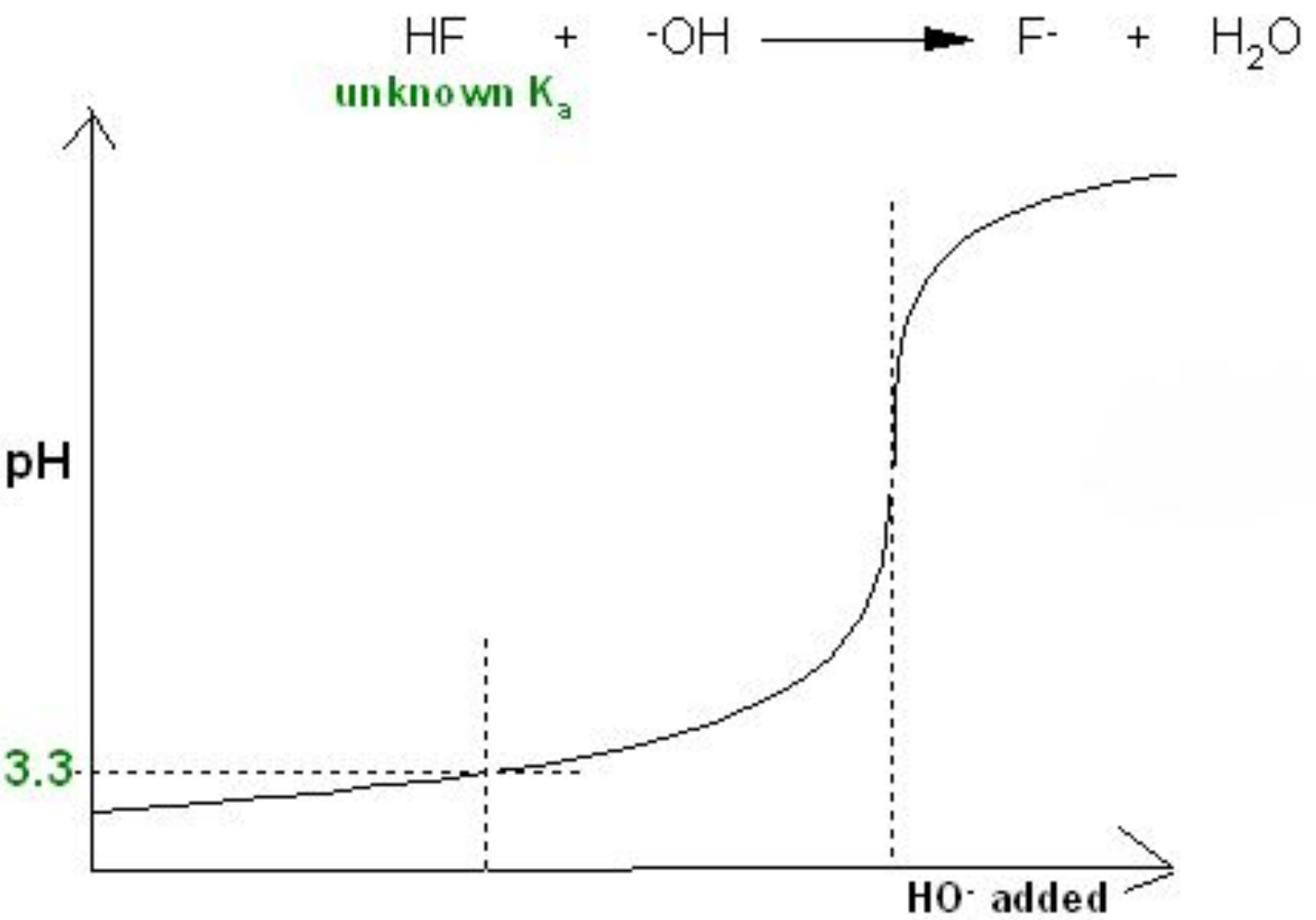
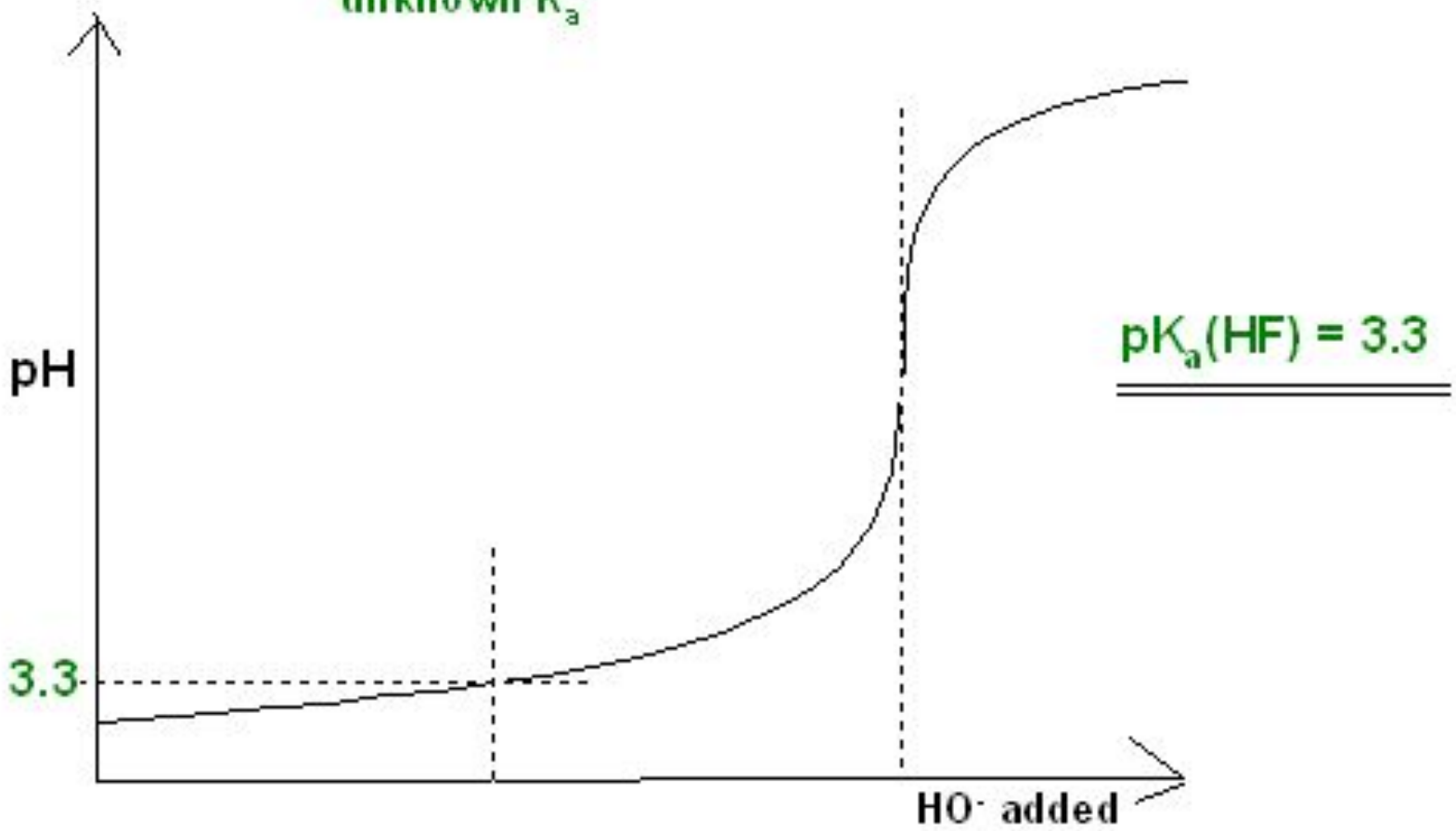


How do you calculate pKa from titration curves?

$$HF + {}^{-}OH \longrightarrow F^{-} + H_2O$$

unknown K_a

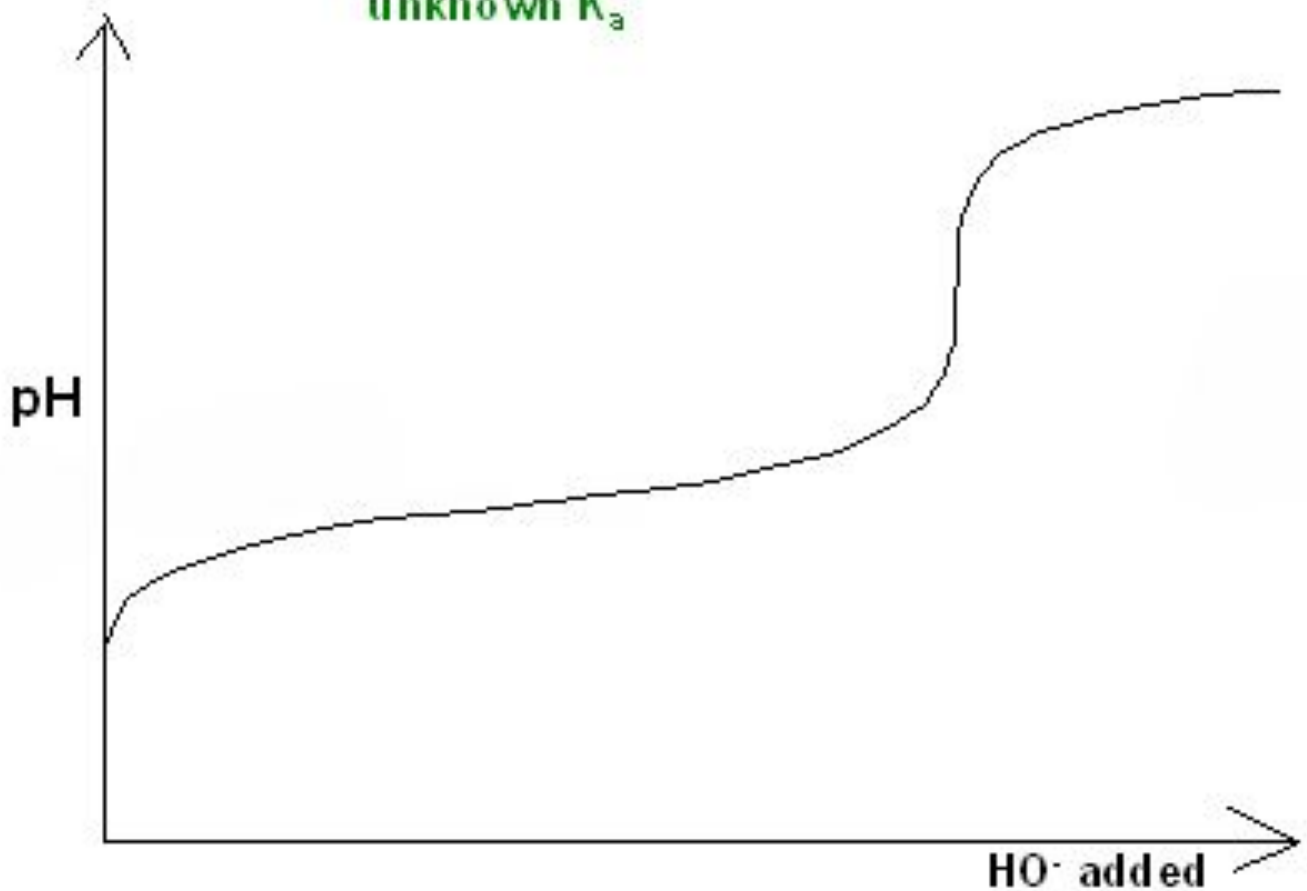


$pK_a(HF) = 3.3$

How do you calculate pKa from titration curves?

$NH_4^+ + {}^-OH \longrightarrow NH_3 + H_2O$

unknown K_a



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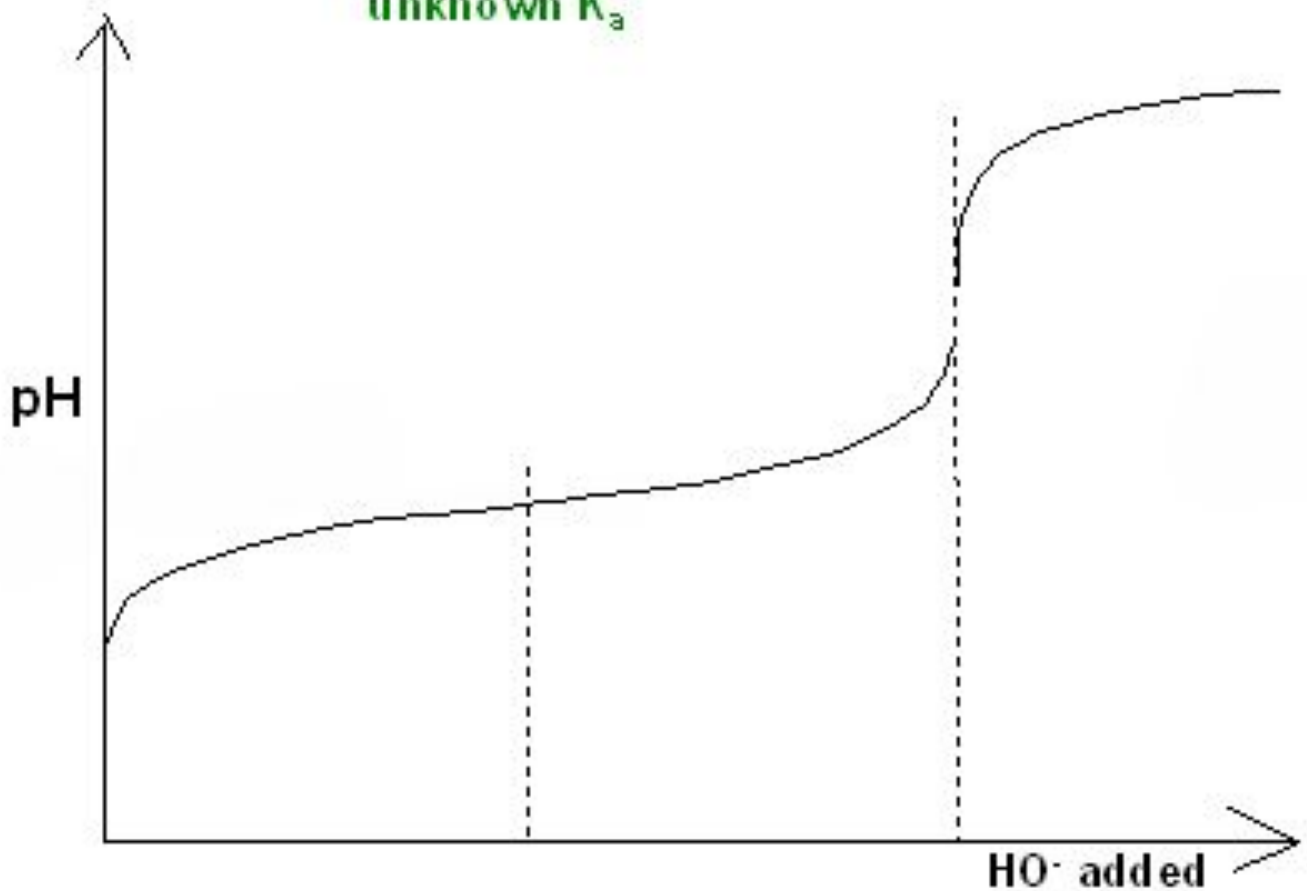

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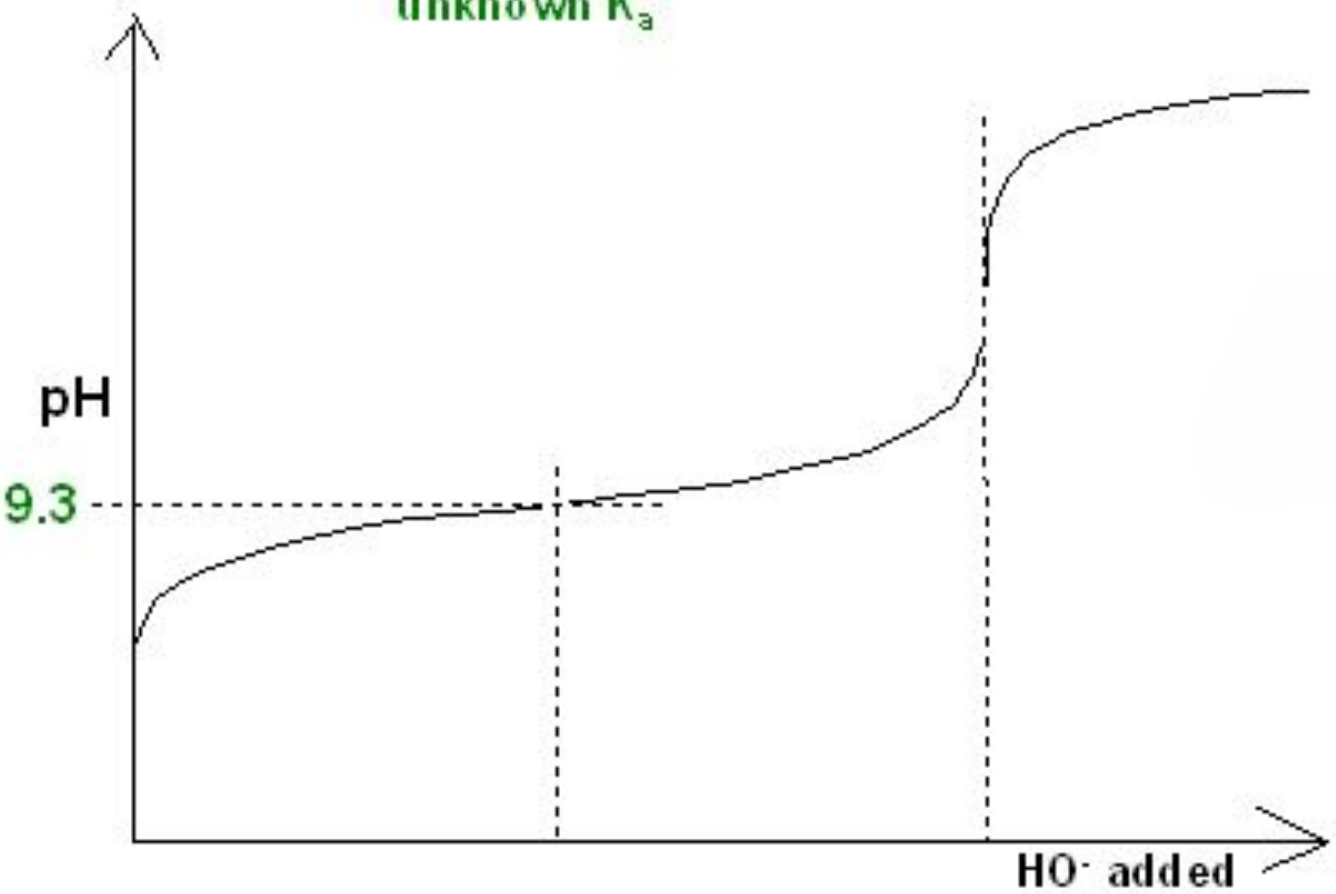

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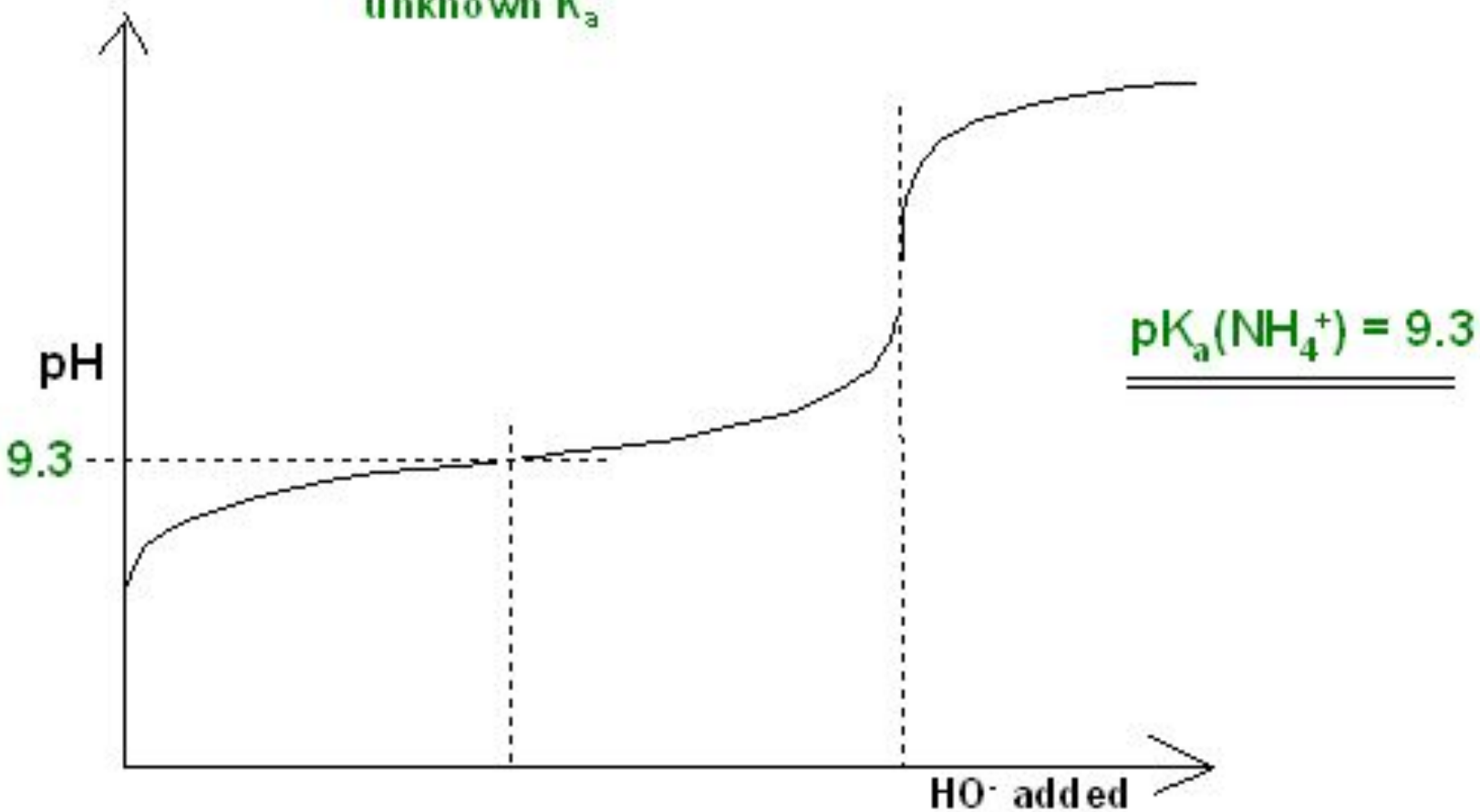
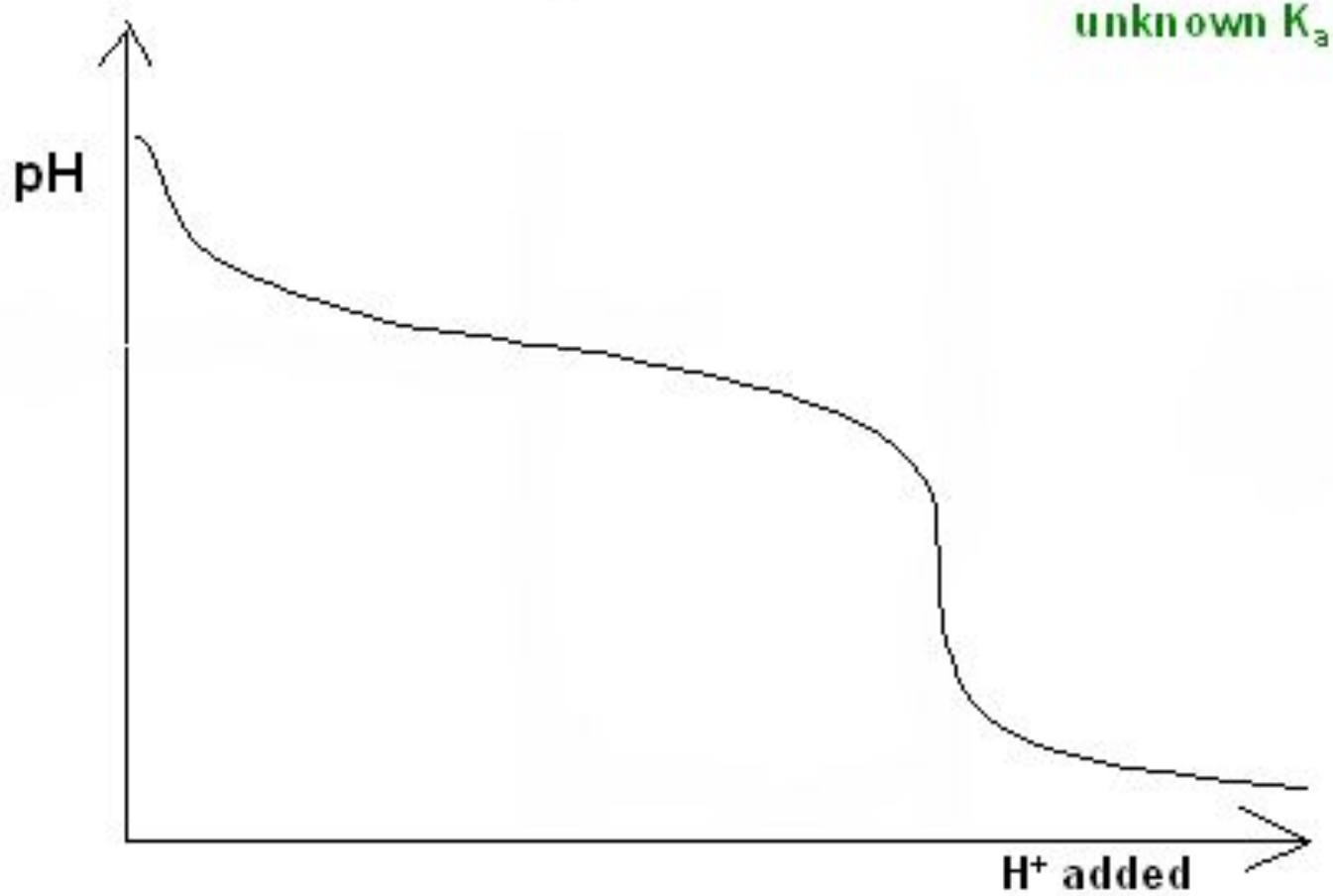


$pK_a(NH_4^+) = 9.3$

How do you calculate pKa from titration curves?

$HSiO_3^- + H^+ \longrightarrow H_2SiO_3$

unknown K_a



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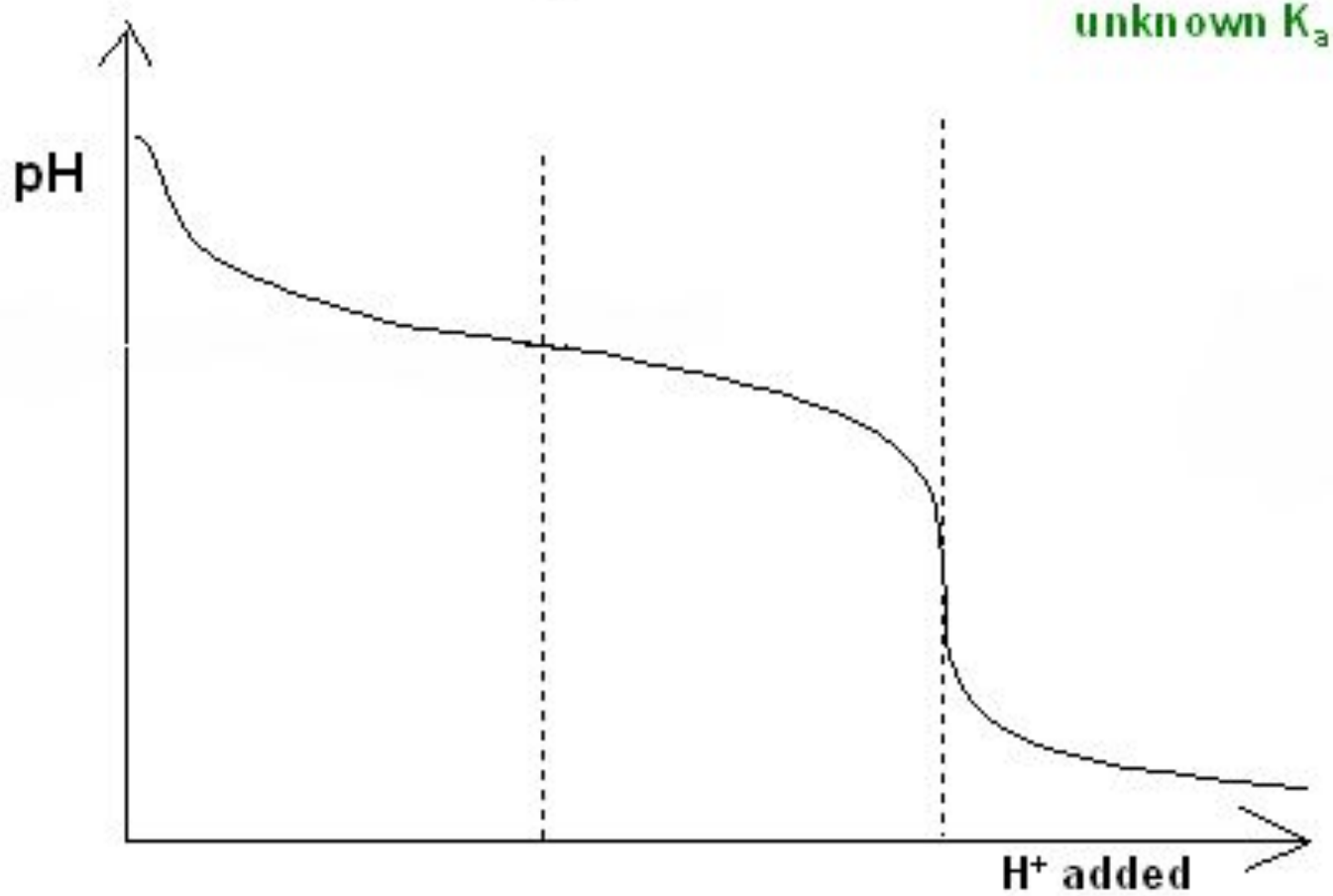

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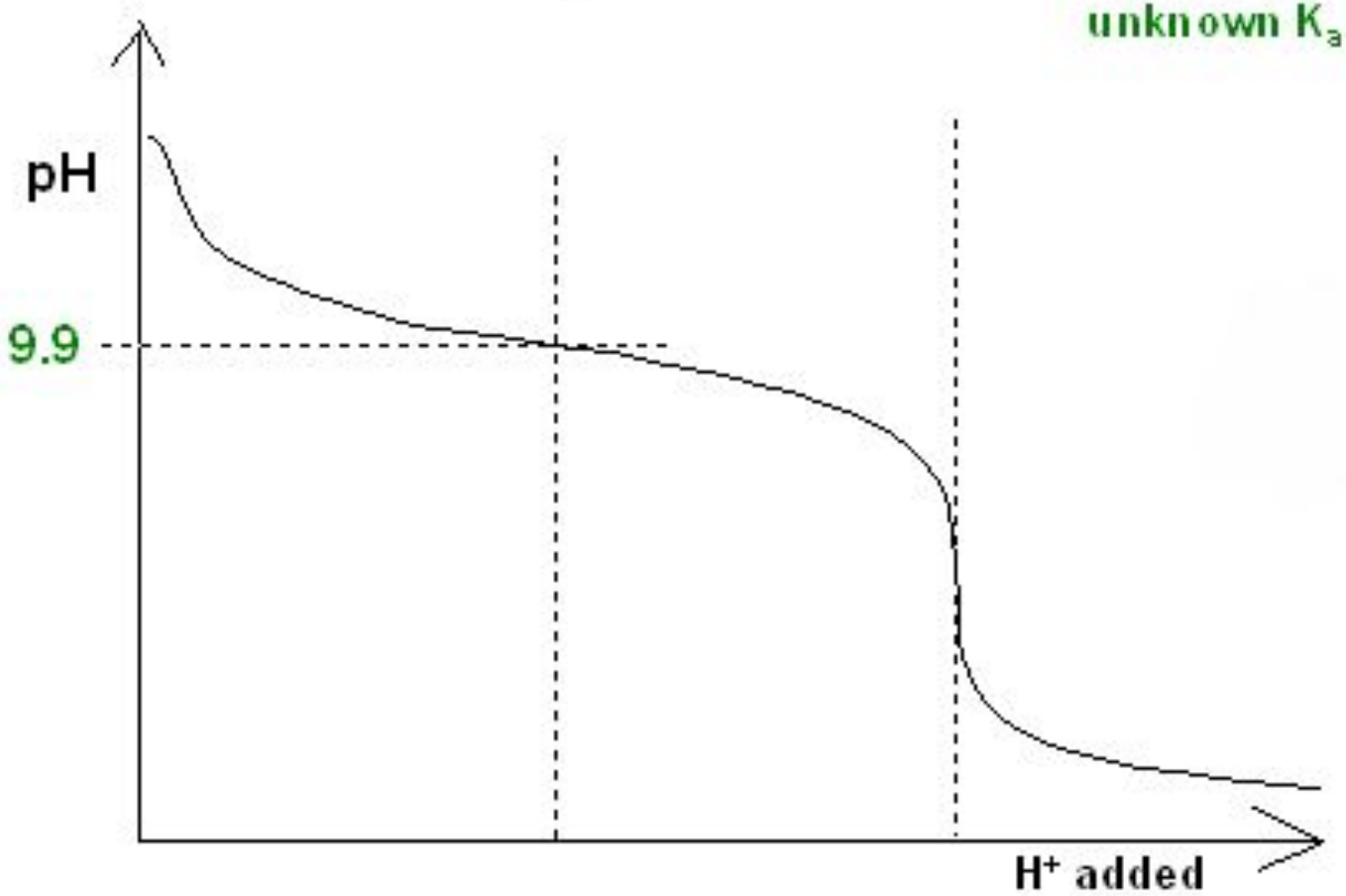

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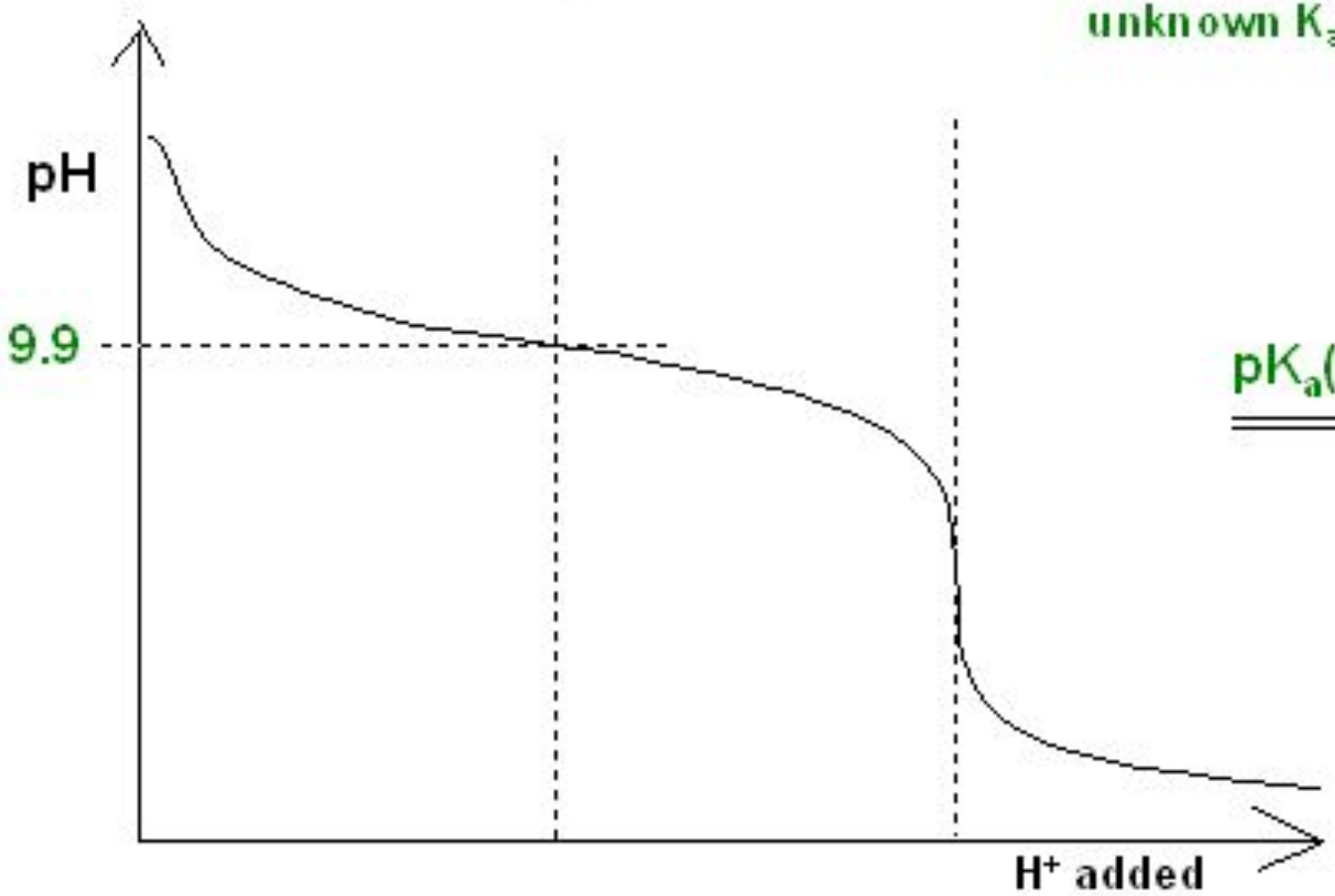
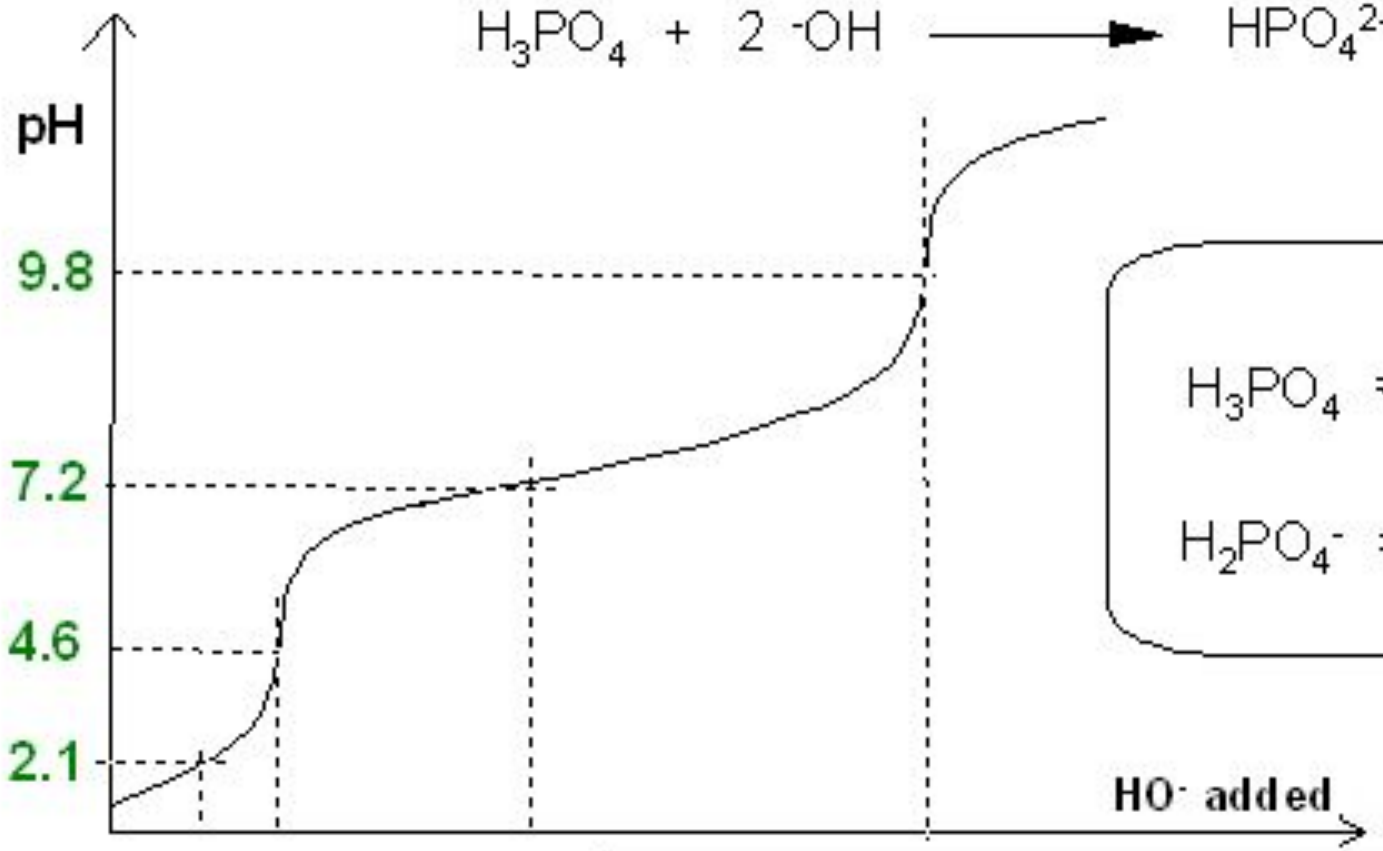


$pK_a(H_2SiO_3) = 9.9$

What are the two Ka values for deprotonation of H_3PO_4

$$H_3PO_4 + 2\ {}^{-}OH \longrightarrow HPO_4^{2-} + 2\,H_2O$$



$$H_3PO_4 \underset{}{\overset{pK_{a1}}{\rightleftharpoons}} H_2PO_4^- + H^+$$

$$H_2PO_4^- \underset{}{\overset{pK_{a2}}{\rightleftharpoons}} HPO_4^{2-} + H^+$$

	pK_{a1}	pK_{a2}
A	9.8	4.6
B	4.6	9.8
C	7.2	2.1
D	2.1	7.2

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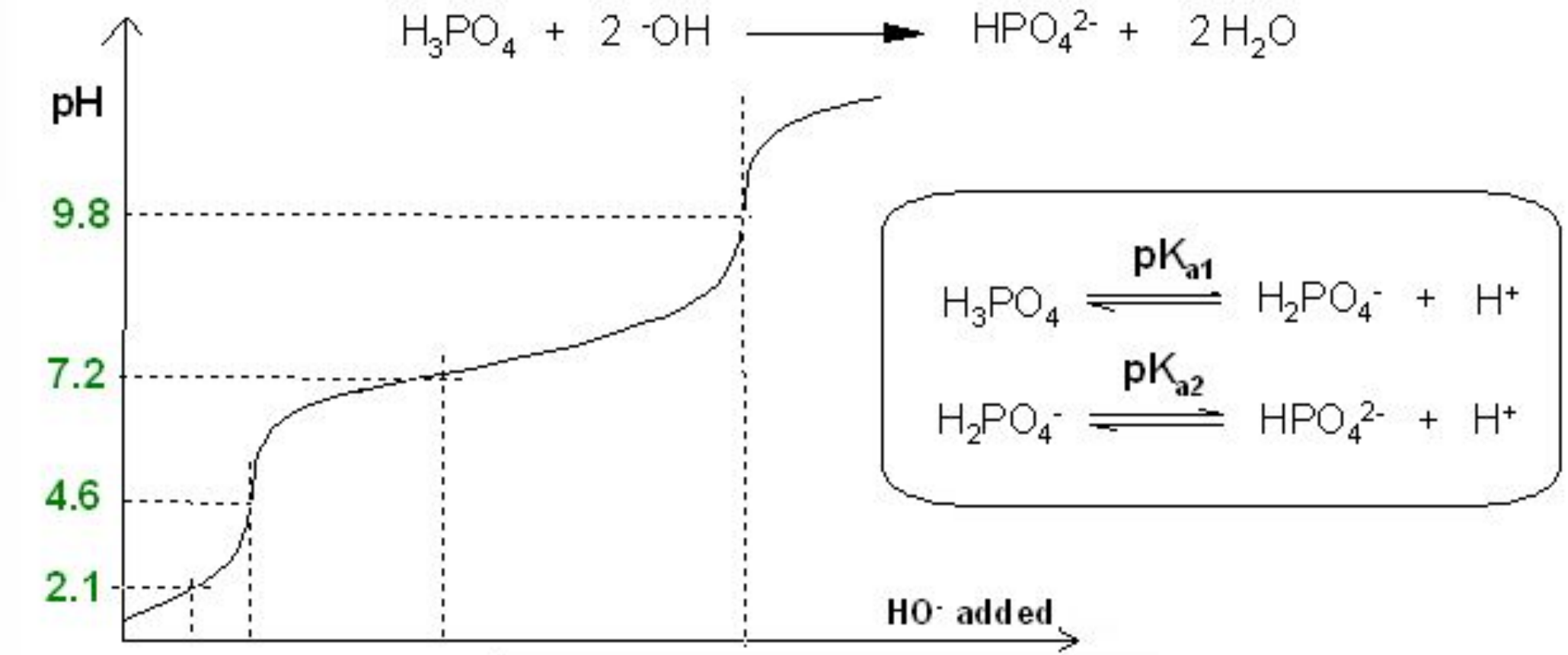

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