

The logo for Next Step Test Prep is centered in a blue square. It features the words "Next" and "Step" in a large, white, sans-serif font, stacked vertically. Below them, the words "TEST PREP" are written in a smaller, white, all-caps, sans-serif font.

Next
Step
TEST PREP

Chemistry review: Acids and Bases

Today's Info Session

- ▶ Introduction
- ▶ Discussion of titrations
- ▶ Equilibria
- ▶ Titrations
- ▶ How Can Next Step Help?
- ▶ Questions?

Next
Step
TEST PREP

MCAT
Medical College
Admission Test

WHAT IS YOUR NEXT STEP?

Introduction

Hi, I'm Phil!

- ▶ **MCAT Content writer**
 - ▶ **Tutored and taught for 9+ years**
 - ▶ **Attended University of Nebraska Medical Center as an MD/PhD student.**
- ✓ **Next Step is a team of test prep and educational experts committed to excellence.**



Who Is Next Step?

Next
Step
TEST PREP

- Began in 2009 as a tutoring company
- Focus on graduate admissions tests only
- Team of educational experts
- First company to have materials built from ground up for 2015 MCAT format
- Now the first company to have new 2018 MCAT Interface

✓ We never stop improving our materials!

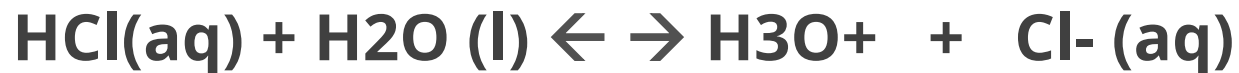


Equilibria

Keq



$$K_{\text{eq}} = \frac{[\text{NH}_3]^2}{[\text{N}_2][\text{H}_2]^3}$$



$$K_{\text{eq}} = \frac{[\text{H}_3\text{O}][\text{Cl}^-]}{[\text{HCl}]}$$

$$\text{pH} = \text{pK}_a + \log\left(\frac{C_b}{A}\right)$$



Types of Keq: K_a , K_b , K_{sp} , K_d , K_a , K_w , K_r , K_f ...

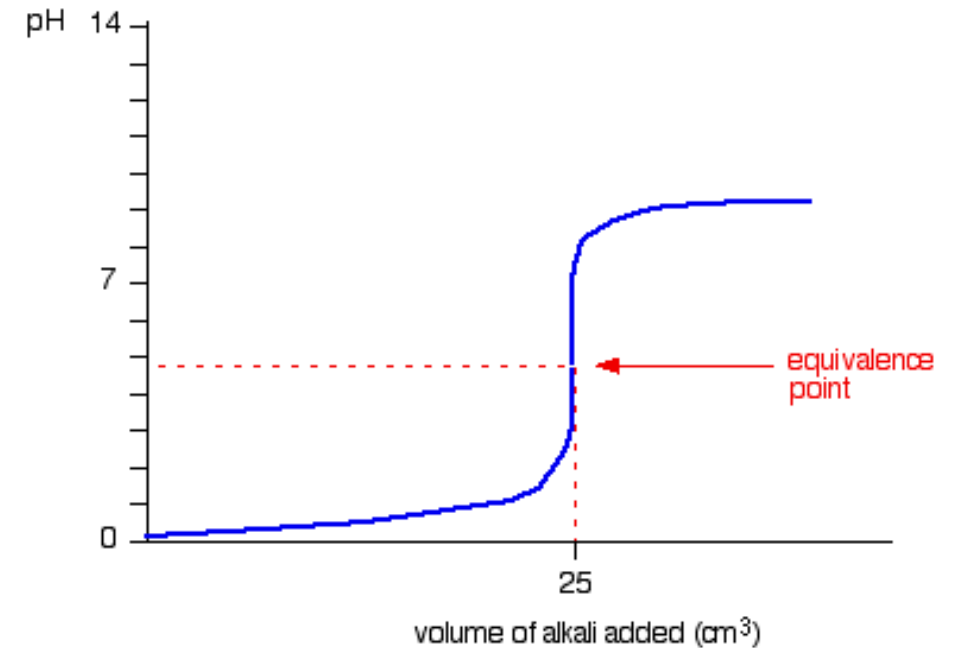
Titration

Used to determine the concentration of an acid or base!

At equivalence point, we have one acid molecule for every base molecule

$$M_a V_a = M_b V_b$$

If I started with 5 mL of an HCl solution and titrated with 1M of a Base as shown, what was my acid concentration?



Was it a strong or weak base?

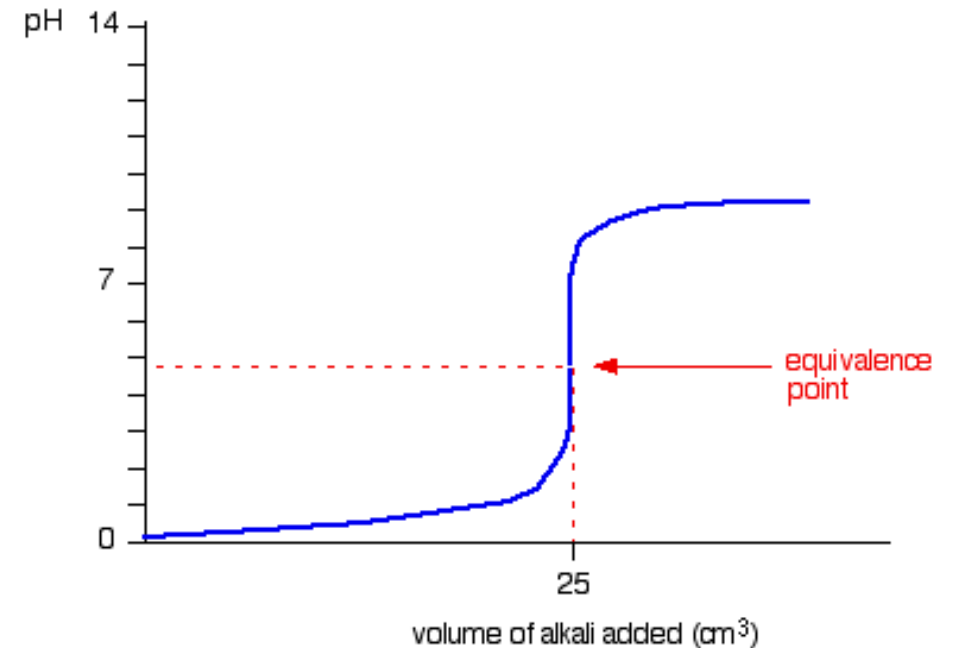
Titration

Where on the graph will I find the most HCl?



What happens at the $\frac{1}{2}$ eq pt?

$$\text{pH} = \text{pKa} + \log \left(\frac{\text{Conjugate base}}{\text{Acid}} \right)$$



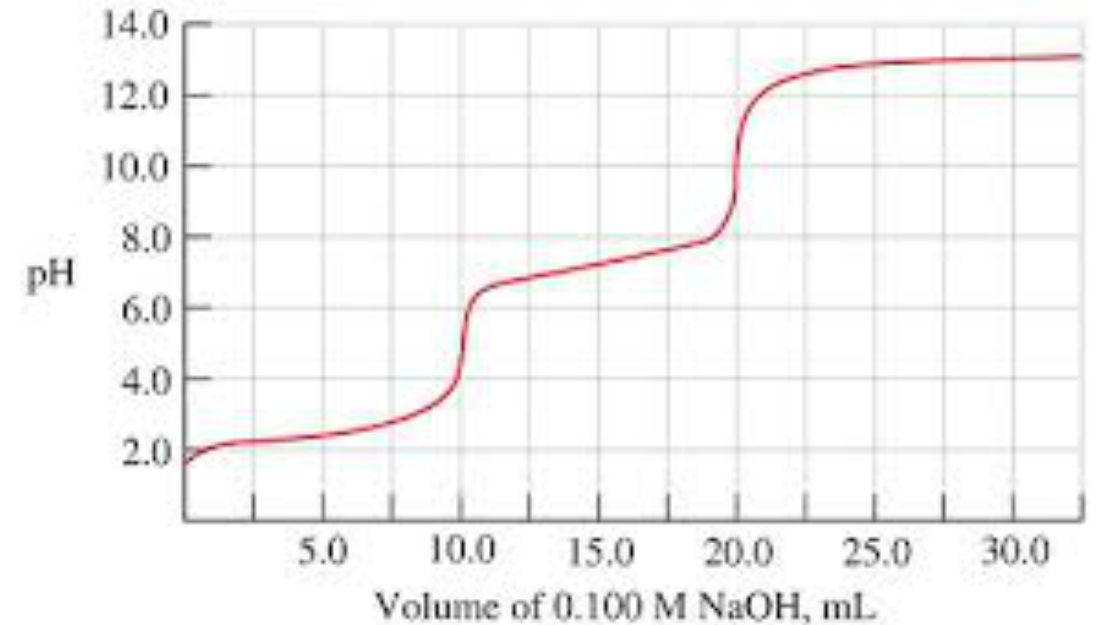
Titration

What can you tell me about my acid?

If I started with 5 mL of my acid, what is its concentration?

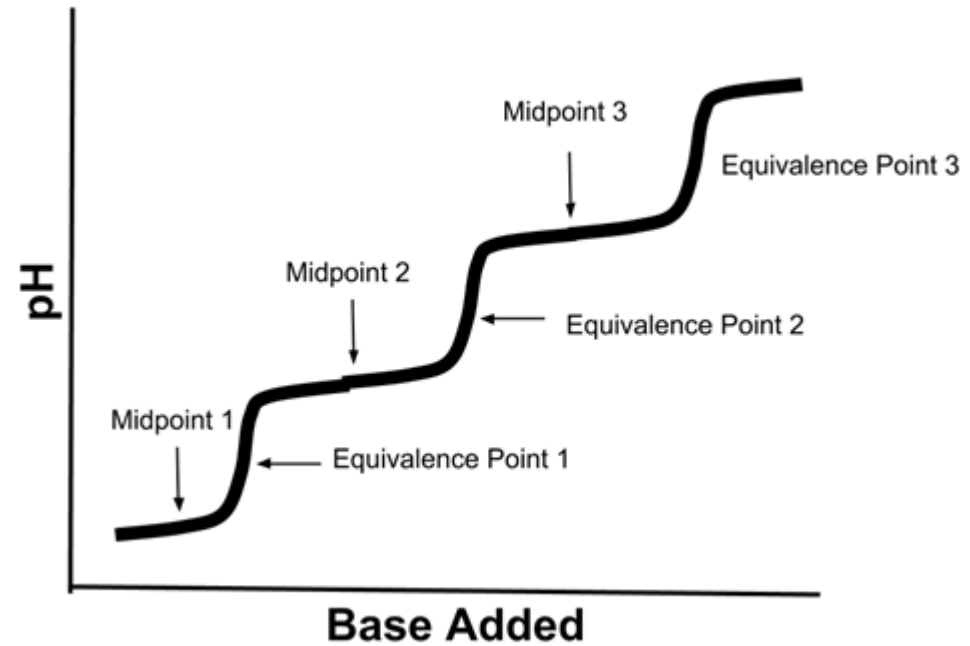
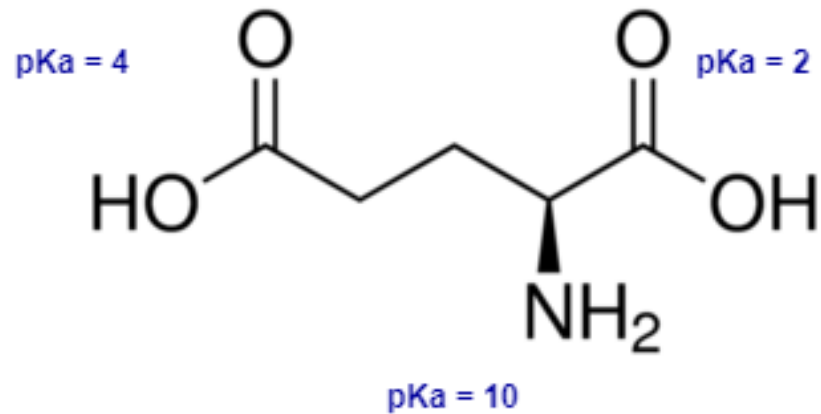
Where on this graph will I find the most HSO_4^- ?

What are the pKas?



Titrations

What is the pH where this molecule has 0 charge overall?



**Next
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Q&A

Next Step: Core Values

Next
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Educate Daily



Approachability



Authenticity



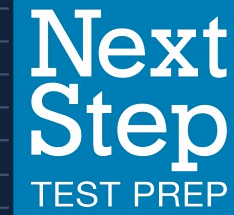
Professionalism



Ownership

We are dedicated to providing **personalized support**,
advice and prep options that match each student's
individual needs.

Students Have a Choice



- ✓ **Over 80,000 students have used Next Step Test Prep in their MCAT Prep journey**

“Next step is an invaluable resource, they truly have the best strategies in regards to approaching each section of this test.” – T.D.

“Next Step helped me take my score from a 496 to a 523!! That's 35th percentile to 99th! Every service they offer is top notch and definitely helps you prepare for the MCAT” - Gus

“This course has significantly improved the way I approach the exam, how I study, and has given me great support with any questions I have had along the way.” - Tyler

Representative Practice Exams

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- ✓ **The most representative practice exams available**
- **Continually updated for AAMC Changes**
- **Most students score within 1-2 points of our tests on the actual exam**



New 2018 MCAT Interface

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- Hundreds of hours of video lessons and content review
- 99th+ Percentile Instructors
- Small-group Office Hours 5 days/week
- Direct access to the MCAT Content Team

Next Step is ready. Are you?

✓ Your practice experience matters! Prep with the most realistic testing environment with Next Step.

Medical College Admission Test - Clara Gillan Time Remaining: 01:21:34
18 of 59

Highlight Strikethrough Flag for Review

Remove Highlight Pause

Figure 1 Eosinophil activation as measured by percent of CD69-positive cells after 3 and 12 hours of co-culture (*p < 0.05, **p < 0.01, ***p < 0.001)

Next, researchers aimed to assess the effect of NK co-culture on eosinophil degranulation. After 3 and 12 hours of co-culture, samples were centrifuged at 1500 rpm, and ECP levels were measured in the supernatants (Figure 2). No ECP was detected in supernatant culture of NK cells alone.

Question 18

Which of the statements below is supported by the experimental results, as shown in Figures 1 and 2?

- A. The duration of Eos co-culture with NK cells directly and linearly correlates to the amount of ECP found in the supernatant after centrifugation.
- B. Cells cultured with a 1:1 NK-to-Eos ratio displayed statistically similar levels of activation to cells cultured with a 5:1 NK-to-Eos ratio, as measured by CD69 expression.
- C. NK co-culture stimulates Eos activation while inhibiting degranulation.
- D. Co-culture with NK cells significantly increased Eos degranulation in all groups, as compared to Eos cells cultured alone.

Periodic Table | Review Screen Previous | Next

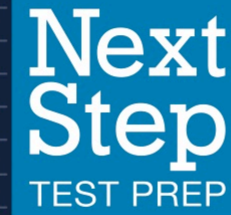
1-on-1 Personal Tutoring

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- ✓ Personalized help from some of the best MCAT experts
- Get matched with a 520+ tutor
- Completely flexible and customizable study plan



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