ORGANIC CHEMISTRY 1 LECTURE GUIDE 2019

BY RHETT C. SMITH

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Organic Chemistry 1 Reaction and Practice Problem Book

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Instructors: Free PowerPoint lecture slides to accompany this text can be obtained by emailing IQ@protonguru.com from your accredited institution email account. The homepage at protonguru.com provides a link to citations to popular text books for further reading on each Lesson topic in this primer.

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Organic Chemistry 1
Lecture Guide 2019

By Rhett C. Smith, Ph.D.

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Companion Books from the Proton Guru:

Organic Chemistry 1 Reactions and Practice Problems 2019

by Rhett C. Smith

Organic Chemistry 1 Primer 2019,

by Rhett C. Smith, Andrew G. Tennyson, and Tania Houjeiry

In General Chemistry we learned about acids and bases, pH, pK_a, etc. We will briefly review some of these ideas. There are various ways to think about acid-base reactions.

Examples

Arrhenius Definition
acid:
base:

acid:
base:

Brønsted-Lowry Definition
acid:
base:

acid:
base:
base:

Lewis Definition
acid:
base:

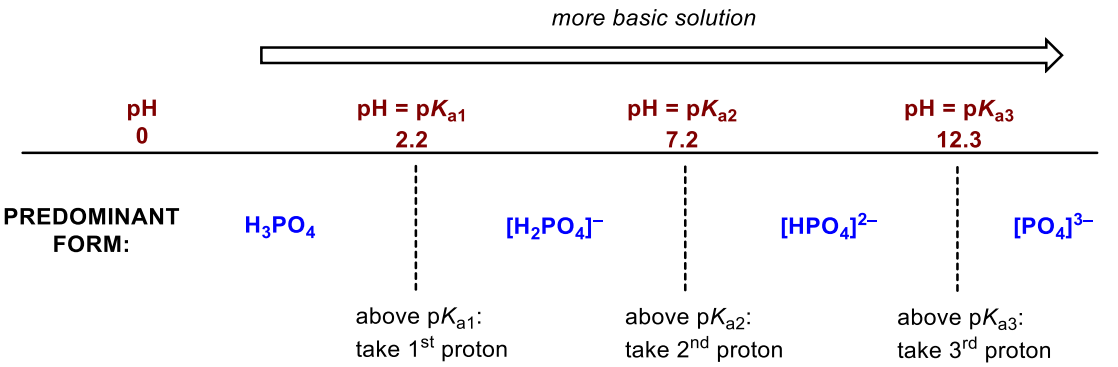
acid:
base:

*recall that in water H^+ forms the hydronium ion, H_3O^+

Notes

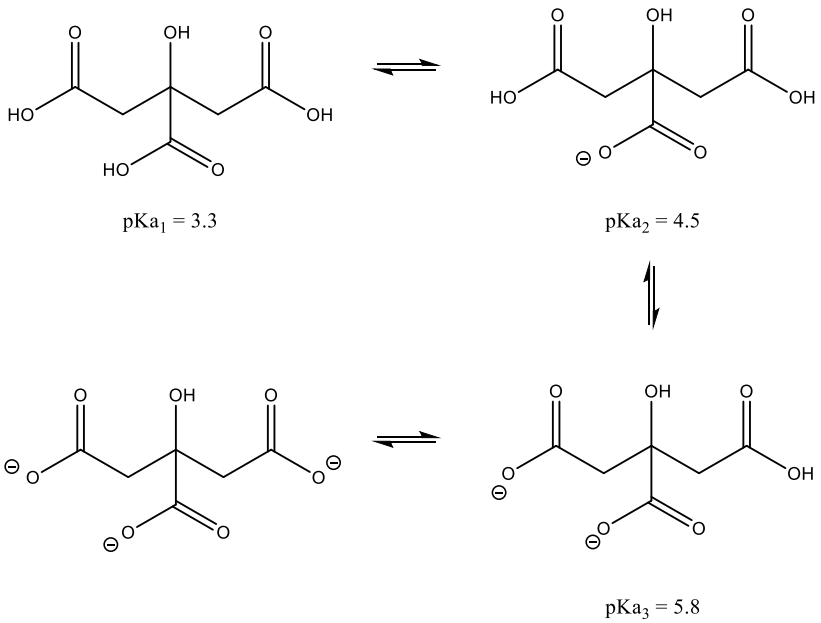
One important skill to develop in organic chemistry is to be able to determine the predominant protonation state of a species in a solution of a certain pH. As a general rule of thumb, a site will keep its proton until the pH of the solution is higher than the pK_a for that site.

Consider phosphoric acid (H_3PO_4), which has pK_{a1} = 2.2, pK_{a2} = 7.2, pK_{a3} = 12.3.



Notes

Example. Citric acid has three common protonation states. What protonation state will predominate at pH = a) 2, b) 3, c) 5, d) 6, and e) 7?



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