

## Understanding Acidic and Basic Conditions

I cannot overemphasize the importance of you having thorough understanding of acid-base concepts.

When you encounter a mechanism (or any reaction), you help your cause by determining if the reaction is happening under acidic or basic conditions because this plays a significant role in how you show the proton transfers in the mechanism. **Know your  $pK_a$  values, and know how to use them!!**

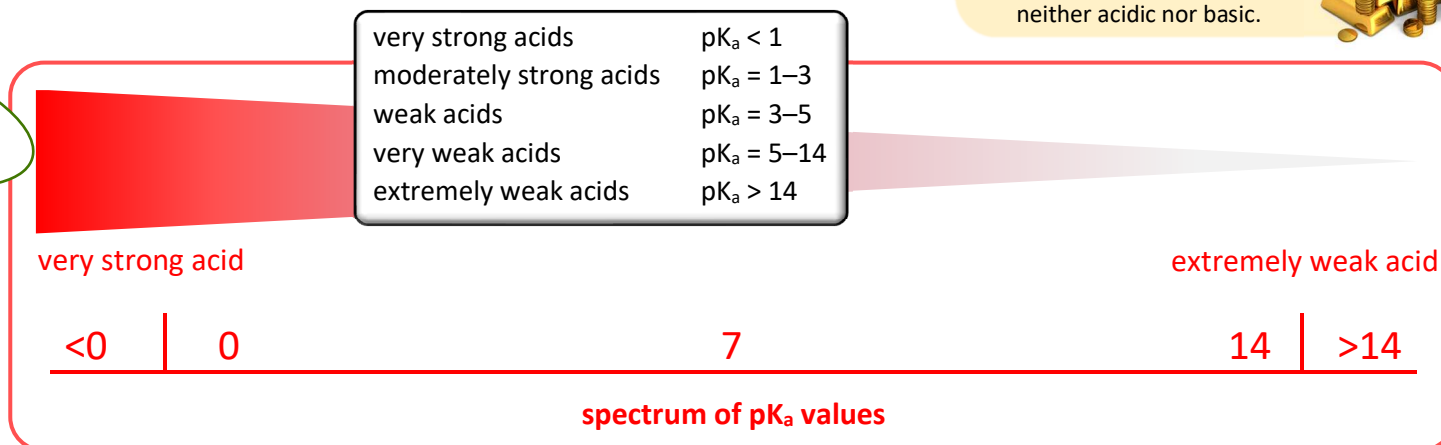
We also want the ability to determine if we have strongly acidic conditions or strongly basic conditions. Understand that strengths are on a spectrum. **Note that basicity is being measured by  $pK_{aH}$  value, NOT by  $pK_a$  value!!!** **NOTE:** The term  $pK_{aH}$  is a shorthand way of saying the  $pK_a$  of the conjugate acid.

**OChem GOLD!**



**PLEASE LEARN THIS.**

- If there is a compound present with a  $pK_a$  value less than 7, you have acidic conditions.
- If there is a compound present with a  $pK_{aH}$  value greater than 7, you have basic conditions.
- If neither of the above conditions exist, the system is neither acidic nor basic.



**SUPER important understandings!!**

**OChem GOLD!**

Extremely weak bases have  $pK_{aH}$  values less than 0.

Very strong bases have  $pK_{aH}$  values greater than 14.

