

Name _____

Period _____

Partner _____

Date _____

Strong vs. Weak Acids

Introduction

This activity using colored beads should help you visualize what is happening inside an acid solution and make the concepts extent of ionization easier to understand.

Procedure

At each station you will find a sealed container holding combinations colored beads. Decide if the contents of the container represent a strong acid or a weak acid. You MAY NOT open the container. Label the appropriate square on your data sheet and draw the contents of the container.

Dish #1 HNO_2

- a) For this acid, what does the blue bead represent? _____ Red bead? _____
b) Write the ionization reaction for this acid:



- c) Record how many of the 10 acid molecules are “Associated” and how many are “Dissociated”. Determine the percentage that dissociated.

Associated acid molecules _____ Dissociated _____

% Acid _____ % Ions _____

Dish #2 HBr

- d) For this acid, what does the blue bead represent? _____ Yellow bead? _____
e) Write the ionization reaction for this acid:



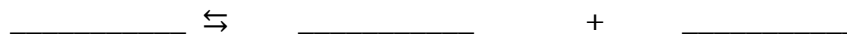
- f) Record how many of the 10 acid molecules are “Associated” and how many are “Dissociated”. Determine the percentage that dissociated.

Associated acid molecules _____ Dissociated _____

% Acid _____ % Ions _____

Dish #3 H₂SO₄

- g) For this acid, what does the blue bead represent? _____ Orange bead? _____
h) Write the ionization reaction for this acid:



- i) Record how many of the 10 acid molecules are “Associated” and how many are “Dissociated”. Determine the percentage that dissociated.

Associated acid molecules _____ Dissociated _____

% Acid _____ % Ions _____

Why are there two blue beads for every orange bead?

Do all of the H⁺ ions ionize at the same time?

Dish #4 HF

- j) For this acid, what does the blue bead represent? _____ Green bead? _____
k) Write the ionization reaction for this acid:



- l) Record how many of the 10 acid molecules are “Associated” and how many are “Dissociated”. Determine the percentage that dissociated.

Associated acid molecules _____ Dissociated _____

% Acid _____ % Ions _____

Dish #5 H_2CO_3

- m) For this acid, what does the blue bead represent? _____ Purple bead? _____
n) Write the ionization reaction for this acid:



- o) Record how many of the 10 acid molecules are “Associated” and how many are “Dissociated”. Determine the percentage that dissociated.

Associated acid molecules	_____	Dissociated	_____
% Acid	_____	% Ions	_____

Why are there two blue beads for every orange bead?

Do all of the H^+ ions ionize at the same time?

Dish #6 HClO_4

- p) For this acid, what does the blue bead represent? _____ Green bead? _____
q) Write the ionization reaction for this acid:



- r) Record how many of the 10 acid molecules are “Associated” and how many are “Dissociated”. Determine the percentage that dissociated.

Associated acid molecules	_____	Dissociated	_____
% Acid	_____	% Ions	_____

Dish #7 H_2SO_3

- s) For this acid, what does the blue bead represent? _____ Orange bead? _____
t) Write the ionization reaction for this acid:



- u) Record how many of the 10 acid molecules are “Associated” and how many are “Dissociated”. Determine the percentage that dissociated.

Associated acid molecules	_____	Dissociated	_____
% Acid	_____	% Ions	_____

Post Lab

1) Fill in the following table

Name of Acid	% Ionization	Strong or Weak
HNO ₂		
HBr		
H ₂ SO ₄		
HF		
H ₂ CO ₃		
HClO ₄		
H ₂ SO ₃		

2)What is the relationship between the % ionization and a strong acid?

3)What is the relationship between the % ionization and a weak acid?

4)What are the six strong acids?

5)What property of a molecule determines how much it will dissociate?

6) What is a diprotic acid?