

Acid-Base Equilibrium BUFFERS

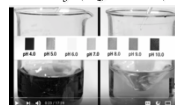
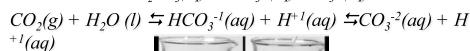
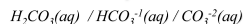
Dr. Ron Rusay

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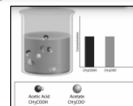
BUFFERS

Weak Acid- Weak Base Systems

Example:



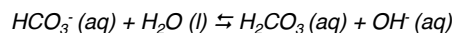
https://www.youtube.com/watch?v=XR_0k8JlawY



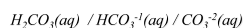
<https://www.youtube.com/watch?v=ZLKEjXbCU30>

QUESTION

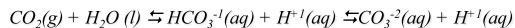
In the following equilibrium:



- A) HCO_3^{-} is an acid and H_2CO_3 is its conjugate base.
- B) H_2O is an acid and OH^{-} is its conjugate base.
- C) HCO_3^{-} is an acid and OH^{-} is its conjugate base.
- D) H_2O is an acid and H_2CO_3 is its conjugate base.
- E) H_2O is an acid and HCO_3^{-} is its conjugate base.



Two VERY IMPORTANT Buffer Systems "Bicarbonate"



1. **Blood:** a human's blood serum volume is relatively small, 4-6 Liters with a narrow pH range, pH = 7.35 – 7.45; pH is maintained through buffering (homeostasis)
Have you ever had respiratory alkalosis during an exam?
2. **Oceans:** an extraordinarily large volume of a "salt water" solution with a pH ~ 8.1; maintained through buffering

Human & Oceanic Bicarbonate Buffer Systems

Acid-Base Disorders

Stephen W. Smith, M.D.
Department of Emergency Medicine
Hennepin County Medical Center

Cartoons Courtesy of Dr. Rock

Resource: www.acid-base.com/Tutorial.htm

<http://chemconnections.org/general/chem121/Buffers/Buffer-Med-Pages.htm>

Overview of Marine Carbon System

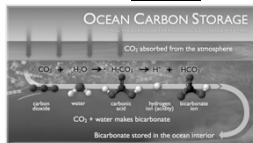
Christopher L. Sabine (NOAA/PMEL)

The carbon dioxide system in sea water: equilibrium chemistry and measurements

Andrew G. Dickson

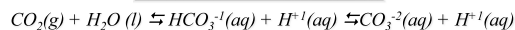
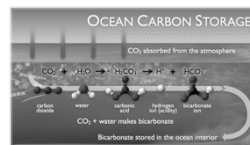
Scripps Institution of Oceanography, University of California, San Diego,
9500 Gilman Drive, La Jolla, CA 92093-0241, USA adickson@ucsd.edu

<http://chemconnections.org/general/chem121/Buffers/Buffer-CO2-Oceans-2011.htm>



EQUILIBRIUM

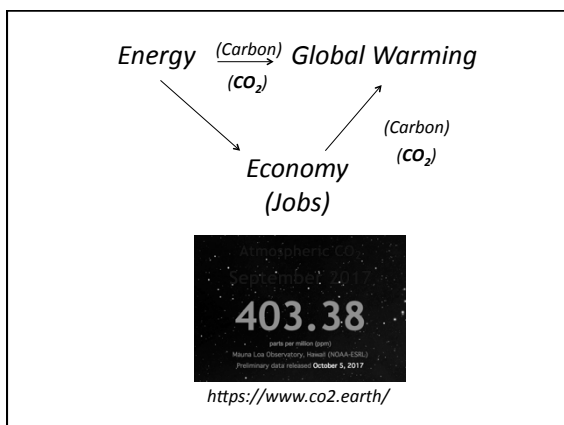
CO₂ & Oceanic Bicarbonate Buffering



Oceans: pH ~ 8.1 and falling

http://www.tos.org/oceanography/issues/issue_archive/22_4.html

Increasing CO₂ is decreasing ocean pH; long term effects?
http://sos.noaa.gov/datasets/Ocean/ocean_acidification.html



Global Warming / Climate Change

<http://chemconnections.org/IFTVET-2016/IFTVET-Global%20Warming.htm>

<http://chemconnections.org/IFTVET-2016/IFTVET-Global%20Warming.htm>

IFTVET
6th International Cooperation Summit Forum
October 21-24, 2016

中国现代职业教育国际合作联合会
International Federation of Technical and Vocational Education & Training

Globalization / Global Warming
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加利福尼亚, 美国

Global Warming, Your Carbon Footprint & Your Future

<http://chemconnections.org/Global%20Warming/>



ipcc
INTERGOVERNMENTAL PANEL ON Climate change

WHO UNEP