

Worksheet
for
Acid - Base Reactions

Name _____

Partner's Name _____

1. Do you really believe it was your voice that changed the indicator color? What chemistry is happening here and what is causing the chemical reaction to occur? Knowing that there is a little bit of NaOH in the flask, write a chemical reaction for the process.

2. There is a lot of limestone (CaCO_3 – very insoluble in water) in the Earth's crust. Stalagmites and stalactites are formed from the reaction of the limestone with carbonic acid (a mixture of CO_2 and $\text{H}_2\text{O} \rightarrow \text{H}_2\text{CO}_3$) to yield $\text{Ca}(\text{HCO}_3)_2$ which is soluble in water. Once the $\text{Ca}(\text{HCO}_3)_2$ is carried into a cave, the CO_2 can evaporate – along with the water - to reform the limestone in the cave, usually in the form of a cone. In the demo we're starting with $\text{Ca}(\text{OH})_2$ instead of CaCO_3 because $\text{Ca}(\text{OH})_2$ is soluble already. Write some chemical reactions that demonstrate what happens in this demo.

3. Why do you think heat caused the precipitate to redissolve? Look at the reaction you wrote in #2 and think about the solubility of a gas in hot water.

4. Bromthymol blue indicator changes color at about $\text{pH} = 7.1$. $\text{Ca}(\text{OH})_2$, as you might guess, is a base. Why did the color change in the demo?

5. Determining the pH values of substances such as grape juice and catsup is difficult. Why?

6. Can you suggest standards for pH 4, 6, and 10?