

# The Ksp of Calcium Hydroxide

HW

## Purpose

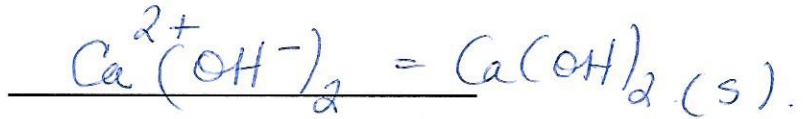
- to determine the Ksp for limewater, aqueous calcium hydroxide

Substances are considered **insoluble** if they cannot be dissolved to form a solution of  $\geq$

0.1 mol concentration.

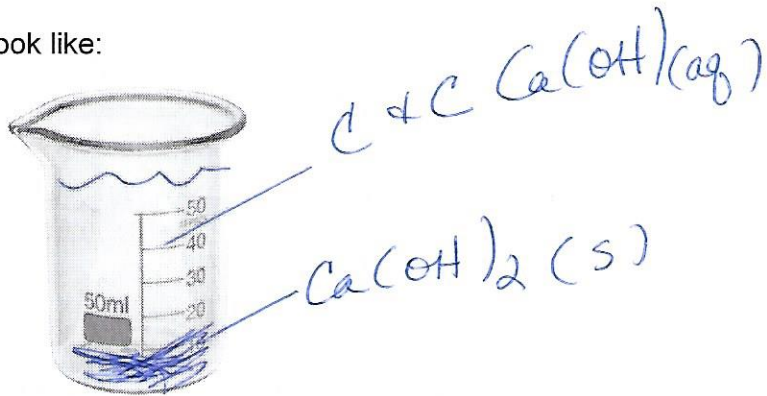
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Formula of calcium hydroxide:



Ms. Purcell and Ms. Wardrop have prepared a saturated soln of calcium hydroxide.

Label the sketch of what this would look like:



What does the saturated calcium hydroxide soln at the front bench in the burets look like?

c+c soln No residue

≡

Why? What did they do?

Ms Purcell filtered the sat soln = filtrate = c+c

## Materials:

- buret with calcium hydroxide at the front bench
- ring stand
- buret clamp
- buret
- hydrochloric acid--concentration 0.070 mol/L HCl
- Erlenmeyer
- ~~BTB~~ (bromothymol blue) dropper bottle
- white square of paper

①  $V_1$  0.00 mL  
 $V_2$  4.60 mL

PHTA

phenolphthalein = fuchsia in bases

**Procedure:**

*-2dp from buret*

- obtain 10.00 mL of unknown concentration of calcium hydroxide saturated soln in Erlenmeyer
- add 5 drops of ~~BTB~~ <sup>PHTH</sup> --dropping--no touching!
- add hydrochloric acid to the buret at your bench
- place Erlenmeyer under buret
- place paper under Erlenmeyer
- add HCl with 2 hands on stopcock
- swirl Erlenmeyer after each addition
- titrate solution until a shade of white zinfandel

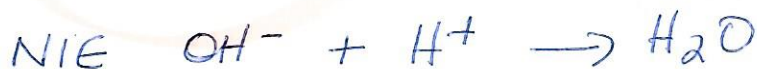
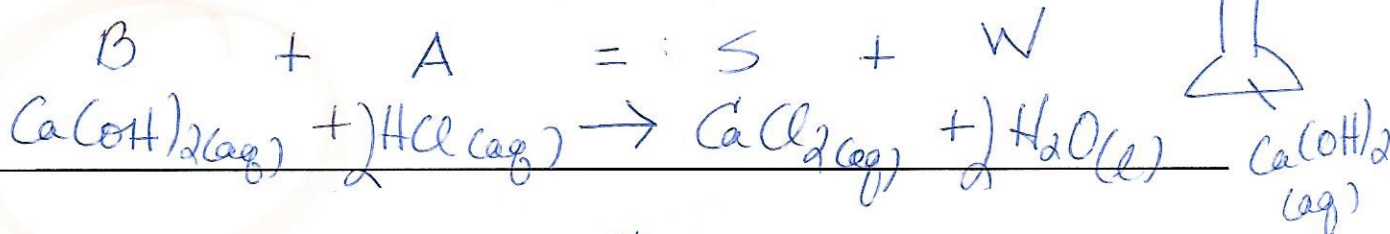
*fuchsia → C + C*

*blush*

*PHTH (alc)  
"tincture of phenolphthalein"*

*I<sub>2</sub> (alc) HCl (aq)*

**BCE for the reaction taking place in the Erlenmeyer**



What is the point of doing the titration?

*to find the conc of [Ca(OH)] = saturated solubility*

Observations:

	HCl (mL) vol 1	HCl (mL) vol 2	
trial 1	0.00	4.60	
trial 2			
trial 3			
	ave		

$$n_B C_A V_A = C_B V_B n_A$$

*Labels: n<sub>B</sub>, C<sub>A</sub>, V<sub>A</sub>, C<sub>B</sub>, V<sub>B</sub>, n<sub>A</sub>  
 (mol/L), vol A, conc B, vol B*

~~$C_1 V_1 = C_2 V_2$~~

Calculations:

- solubility of  $\text{Ca}(\text{OH})_2$
- 1)  $C_B$ ? use formula OR (DA)
- 11)  $K_{sp}$

Ionic dissociation equation for calcium hydroxide:

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$K_{sp}$  Expression:

$K_{sp} =$  \_\_\_\_\_

Conclusion: \_\_\_\_\_

Questions

1) What is the difference between an endpoint and an equivalence point?

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2) Is calcium hydroxide soluble? How do you know? Explain.

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