

Titration of Toilet Bowl Cleaners

Materials: (1 pt) List all materials used.

TBC, NaOH, buret, Transfer pipet, pipet bulb, Erlenmeyer flask, phenolphthalein, stirrer, H₂O

Procedure: (6 pts)

- 1) Transfer 17.6 ml into flask dilute to 50 ml
- 2) add 3 drops phenolphthalein
- 3) prep buret - 11M NaOH - record V_{initial}
- 4) add NaOH with stirring until light pink - record V_{final}
- 5) repeat 2 more times

Hints: (3 pts) What things must you know before you start the experiment?

M NaOH, is TBC acidic or basic or anything else

(2 pts) What things must be recorded?

V_{TBC} V_{I, NaOH} V_{F, NaOH}

(2 pt) Should you use the toilet bowl cleaner at full strength or should be it be diluted? Why?

Use less NaOH

(2 pts) What indicator should you use?

any that change around pH 7

(5 pts) Nice and neat data table?

The works	V _{TBC}	V _F	V _I	V _{used}
1				
2				
3				

must have
 • — — repeat for
 on all
 NaOH V's

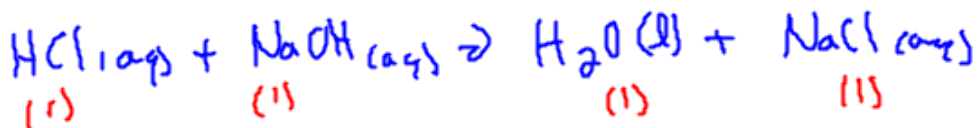
Repeat for the other cleaner.

Post Lab:

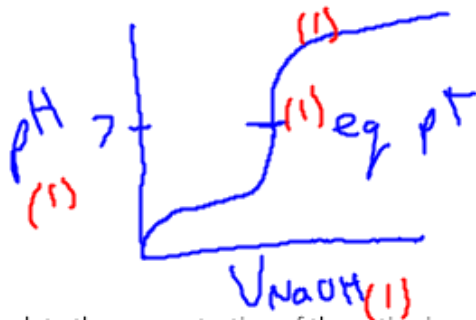
1. (2 pts) What is the active ingredient in the toilet bowl cleaner?

HCl
(2)

2. (4 pts) Write a balanced chemical reaction with physical states.



3. (4 pts) Draw a titration curve. Label the axes and the equivalence point.



4. (6 pts) Calculate the concentration of the active ingredient in the toilet bowl cleaner.

$$\text{avg ml} \times \frac{0.11 \text{ mol NaOH}}{\text{L}} \times \frac{1 \text{ mol HCl}}{1 \text{ mol NaOH}} \times \frac{1}{17.6 \text{ ml}} \times 60 = \text{M HCl}$$

(1) (1) (1) (1)

repeat for symbol
(1) (1) (1)

5. (4 pts) Which toilet bowl cleaner should I use to clean my toilet? Justify your answer with two different reasons.

the works - more HCl (1) - the name
- cost
- smell, color

Conclusion: (3 pts) The usual!

Learned, Errors, Real world App
(1) (1) (1)