TWO-POINT TITRATION METHOD FOR ALKALINITY DETERMINATION

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0.05N KHP Solution Normality

\[
KHP \text{ Normality} : \frac{10.2115 \text{ g}}{W} = \frac{0.05 \text{ N}}{X}
\]

Where:
- \( W \) = exact weight of KHP in g
- \( X \) = exact normality of KHP
CALCULATIONS

0.1N NaOH Solution Normality

\[
NaOH \text{ Normality} = \frac{A \times B}{20 \text{ ml NaOH}}
\]

Where:
- A = Normality of KHP
- B = Average mL of KHP used
CALCULATIONS

0.1N HCl Solution Normality

\[ HCl \text{ Normality} = \frac{(20 \text{ ml NaOH}) \times C}{D} \]

Where:
- C = Normality of NaOH solution
- D = Average mL of HCl used
Alkalinity, mg CaCO₃ / mL

\[ Alk = \frac{A \times N \times 50,000}{\text{mL supernatant}} \]

Where:
- A = mL standard HCl
- N = Normality of standard HCl
Alkalinity, mg CaCO$_3$ / mL

\[ Alk = \frac{A \times N \times 50,000}{\text{mL supernatant}} \]

...so, for 16.6 ml standard HCl (A) and 0.09892N (N) standard HCl, alkalinity is (as mg CaCO$_3$) into 25 mL of supernatant:

\[ \frac{16.6 \times 0.09892 \times 50,000}{25} = 3,280 \]
SUMMARY

- Two-point titration end points pH 5.75 and 4.0
- Around 80% of usable alkalinity is reached by pH 5.75
- Higher % alkalinity below pH of 5.75 may be an indication of potential digester problems
Pros & Cons of Two-Point Titration Method

**Pros**
- Easy, fast, and generally affordable way to check digester condition
- Less technical and time consuming when compared to current methods of checking VFA

**Cons**
- Becoming familiar with titrating (if not currently doing)
- More difficult if no centrifuge (need to separate supernatant)
- Not a reportable method
OTHER METHODS TO CONSIDER

- GC or MS - More accurate but requires expensive, highly technical equipment
- Steam Distillation - Complex and time consuming method
- Kits (such as Hach TNTplus reagent kit, others?) - May provide reasonable results (anyone using or familiar with?) but may require an expensive spectrophotometer that may not be worth acquiring for just this test.
QUESTIONS?

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