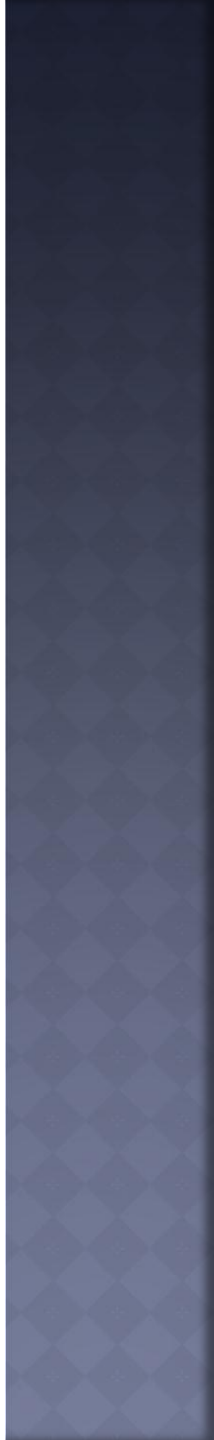
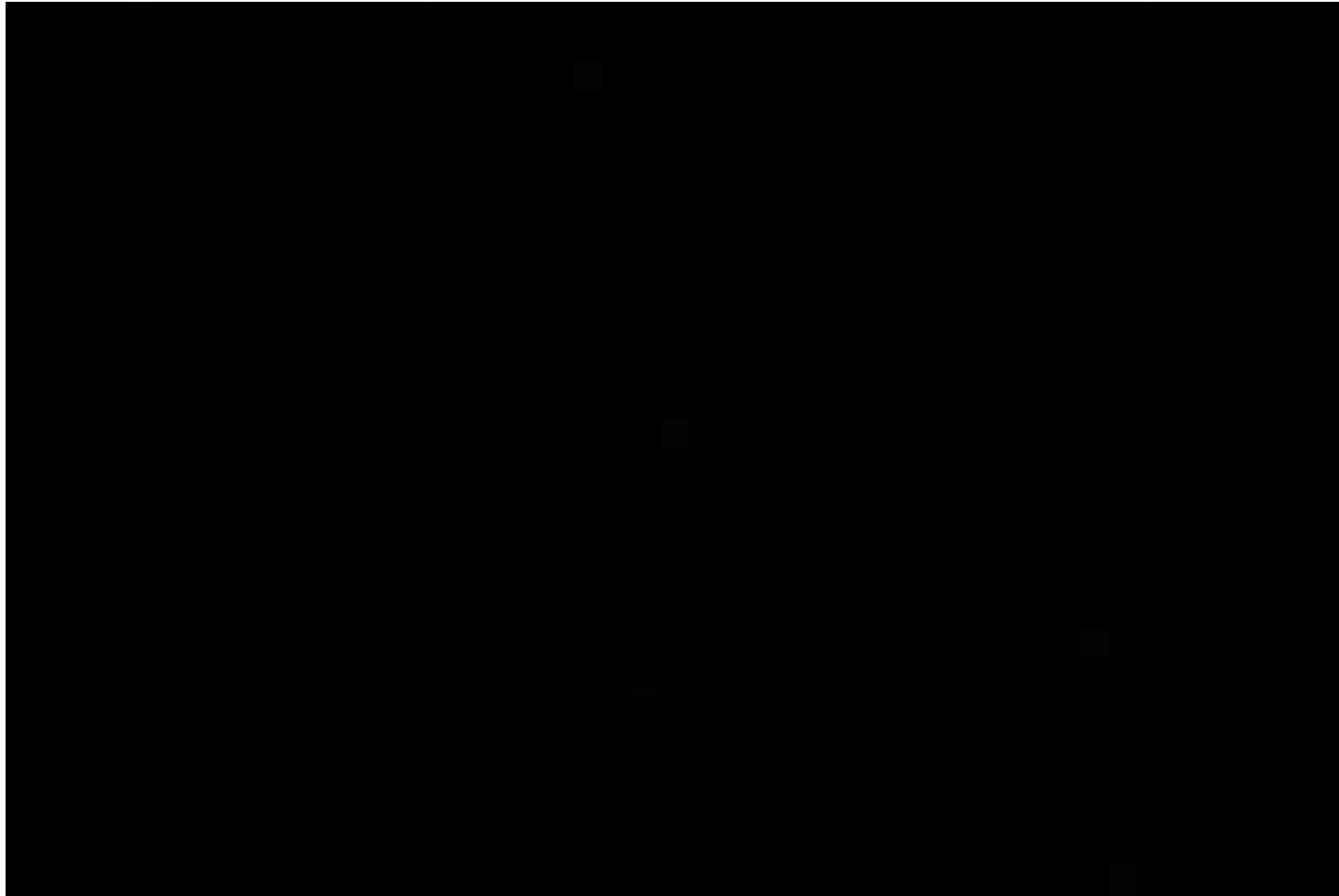


TWO-POINT TITRATION METHOD FOR ALKALINITY DETERMINATION

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OVERVIEW OF METHOD



CALCULATIONS

○ 0.05N KHP Solution Normality

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

- Where:
 - W = exact weight of KHP in g
 - X = exact normality of KHP

CALCULATIONS

○ 0.1N NaOH Solution Normality

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

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

CALCULATIONS

○ 0.1N HCl Solution Normality

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

- Where:
 - C = Normality of NaOH solution
 - D = Average mL of HCl used

CALCULATIONS

- 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

CALCULATIONS

- Alkalinity, mg CaCO₃ / 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 CaCO₃) 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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