

SU KİMYASI

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Molarite ve Normalite

Molarity = Mol sayısı / L solusyon

Normalite = gr ekivalent sayısı / L solusyon

H_2SO_4 Molek Ağır 98 g;

gr ekival = $98\text{gr}/2$

1 L distile su

ile tamamla

$$N = 100 \text{ ml} / (98/2) / 2L$$

$$M = 100 \text{ ml} / (98) / 2L$$

100 ml H_2SO_4

ekle



1 L N/50 (0.02 N) HCl nasıl hazırlanır ?

$$0.02 \text{ N} = x \text{ gr}/(36.5/1)/ 1 \text{ L}$$

$$X = 36.5 \text{ gr} * 0.02 = 0.73 \text{ g}$$

$$\text{HCl Yoğunluğu} = 1.015 \text{ g/ml}$$

$$\text{HCl hacmi} = 0.73 \text{ ml}/1.015 \text{ g/ml} = 0.72 \text{ ml}$$

1 L distile su
ile tamamla

0.72 ml H₂SO₄
ekle



TİTRASYON



$$V_{\text{Asit}} = ?$$

$$N_{\text{Asit}} = 0.2 \text{ N}$$

$$N_{\text{Asit}} * V_{\text{Asit}} = N_{\text{Baz}} * V_{\text{Baz}}$$

$$\text{meq Asit/L} * L_{\text{Asit}} = \text{meq-Baz/L} * L_{\text{Baz}}$$

$$0.2 \text{ N} * V_{\text{Asit}} = 200 \text{ ml} * 1.5 \text{ N}$$

$$V_{\text{Asit}} = 1.5 \text{ L}$$

$$\rightarrow V_{\text{BAZ}} = 200 \text{ ml}$$

$$N_{\text{Baz}} = 1.5 \text{ N}$$

mg/L CaCO₃ eşdeğeri

Neden N/50 H₂SO₄ kullanılıyor ?

(eklenen 1ml of N/50 H₂SO₄) * (0.02 meq/L) *
50 mg /meq CaCO₃ = 1 mg/L CaCO₃

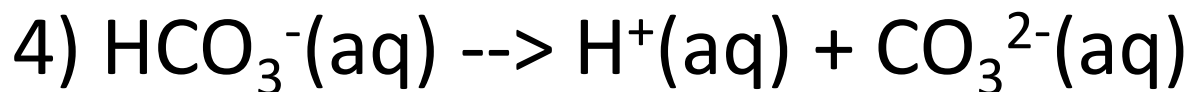
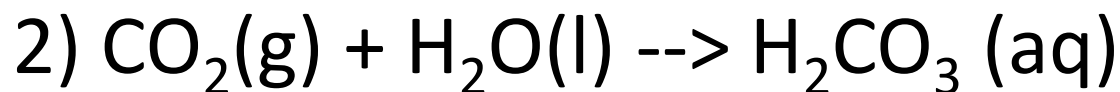
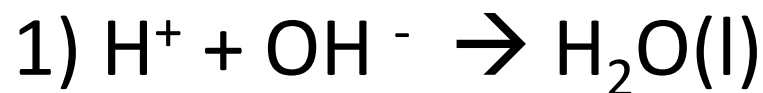
kullanılan 1 ml N/50 H₂SO₄ = 1 mg/L CaCO₃

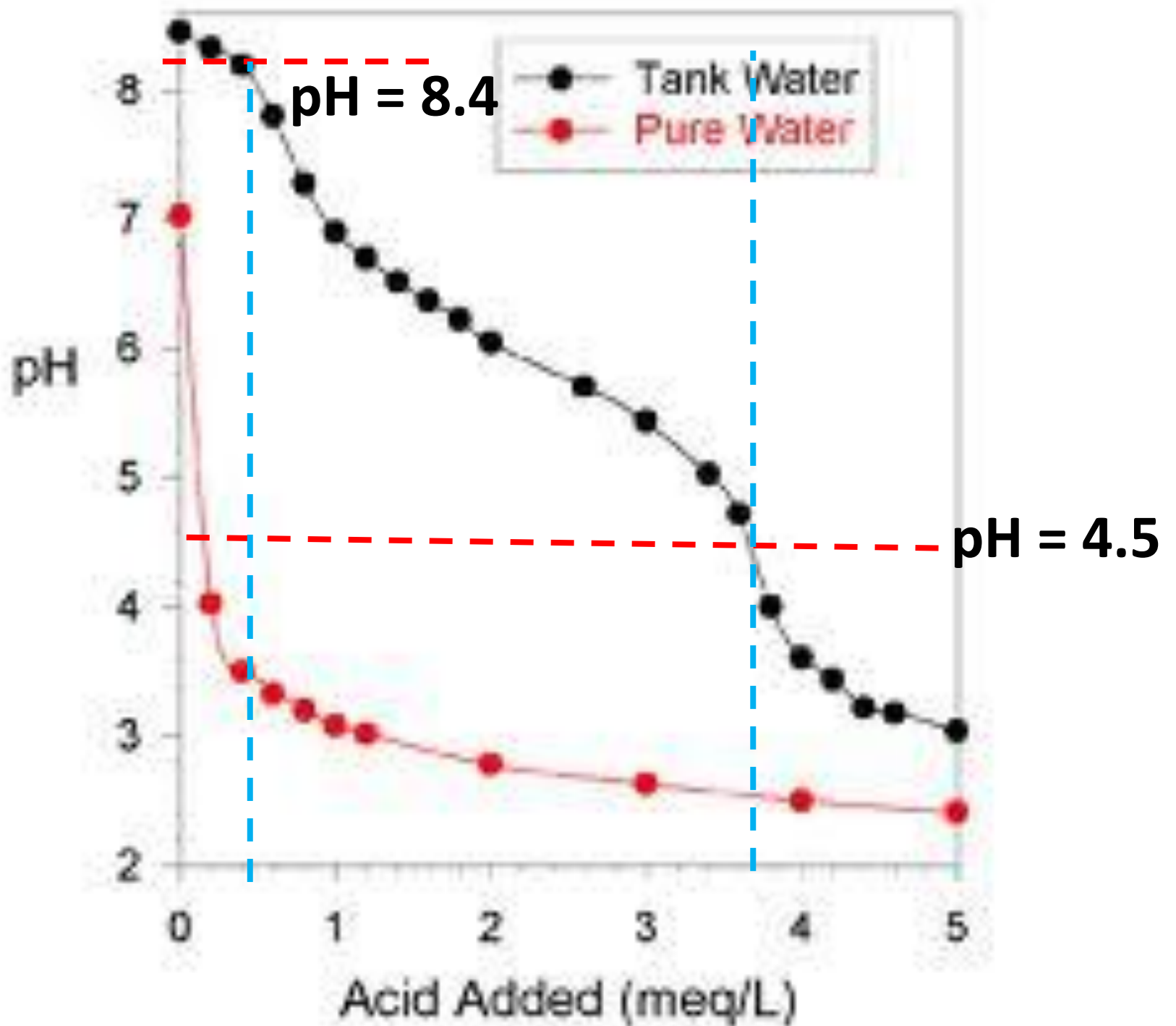
CaCO₃ molekül ağırlığı = 100 g

CaCO₃ gram ekivalent ağırlığı = 100 g / 2 = 50 g

Qələvilik(ALKALİNİTE)

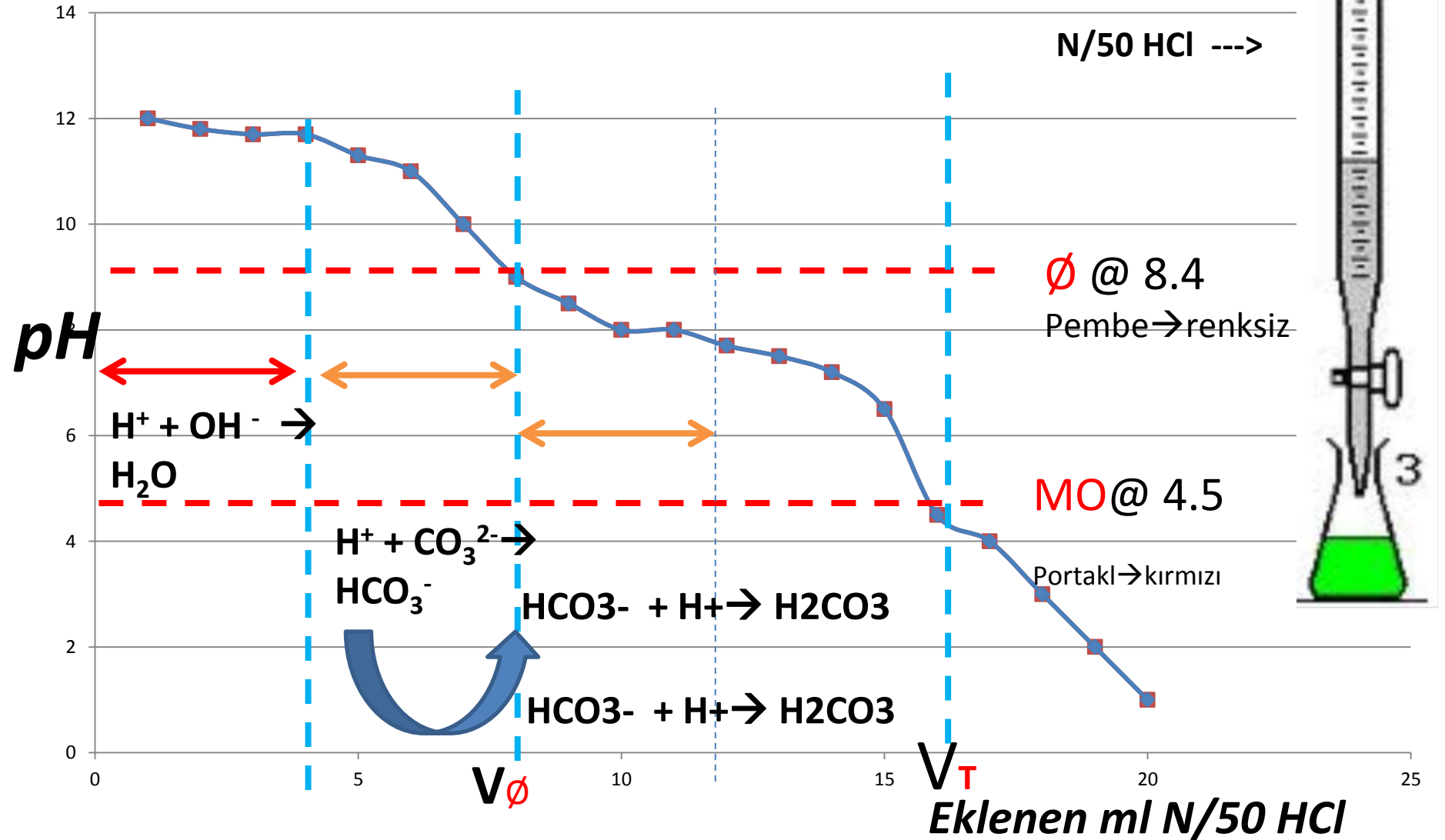
Suyun pH balansının dəyişməsinə qarşı dirənməsi



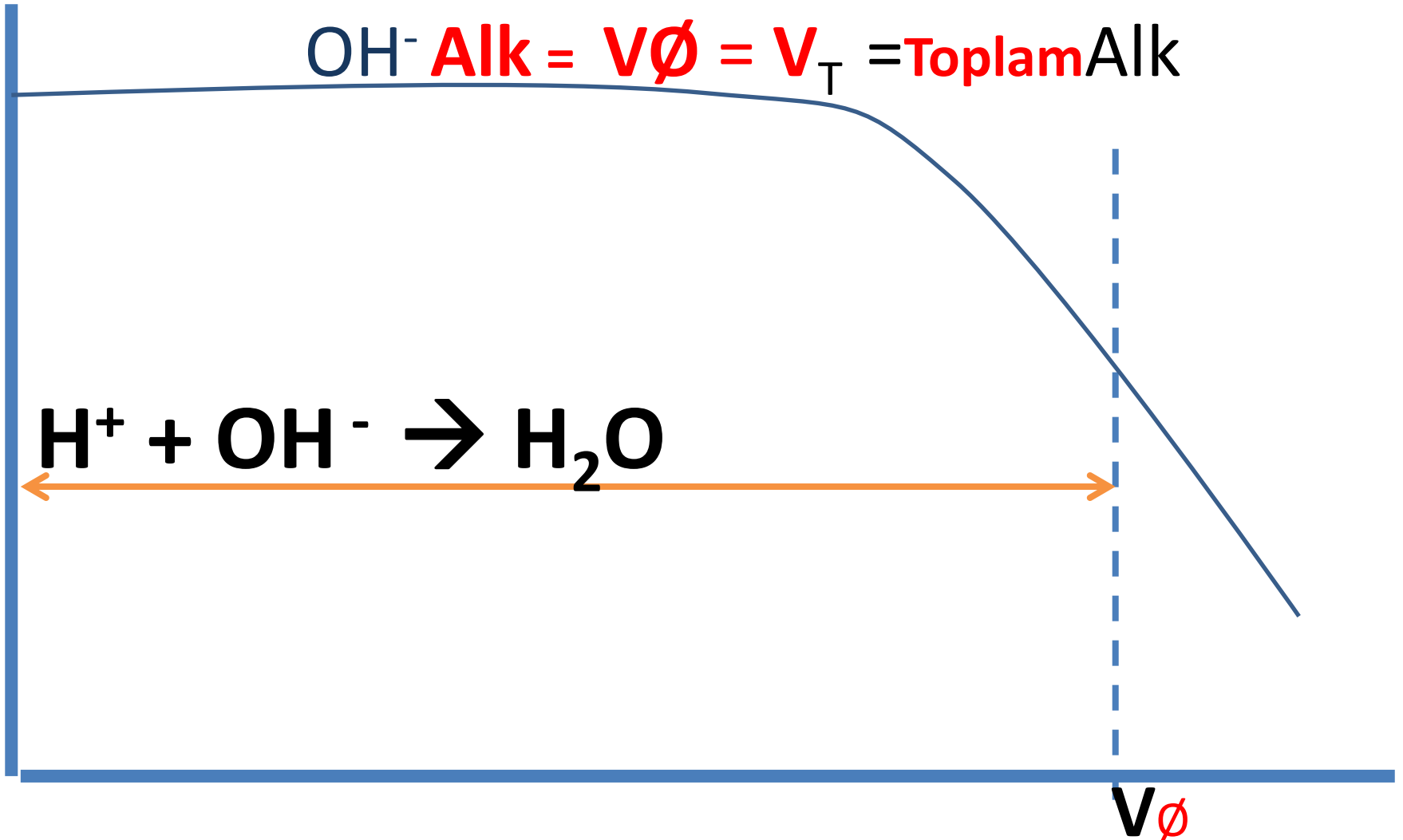


Qələvilik(ALKALİNİTE) ölçümü

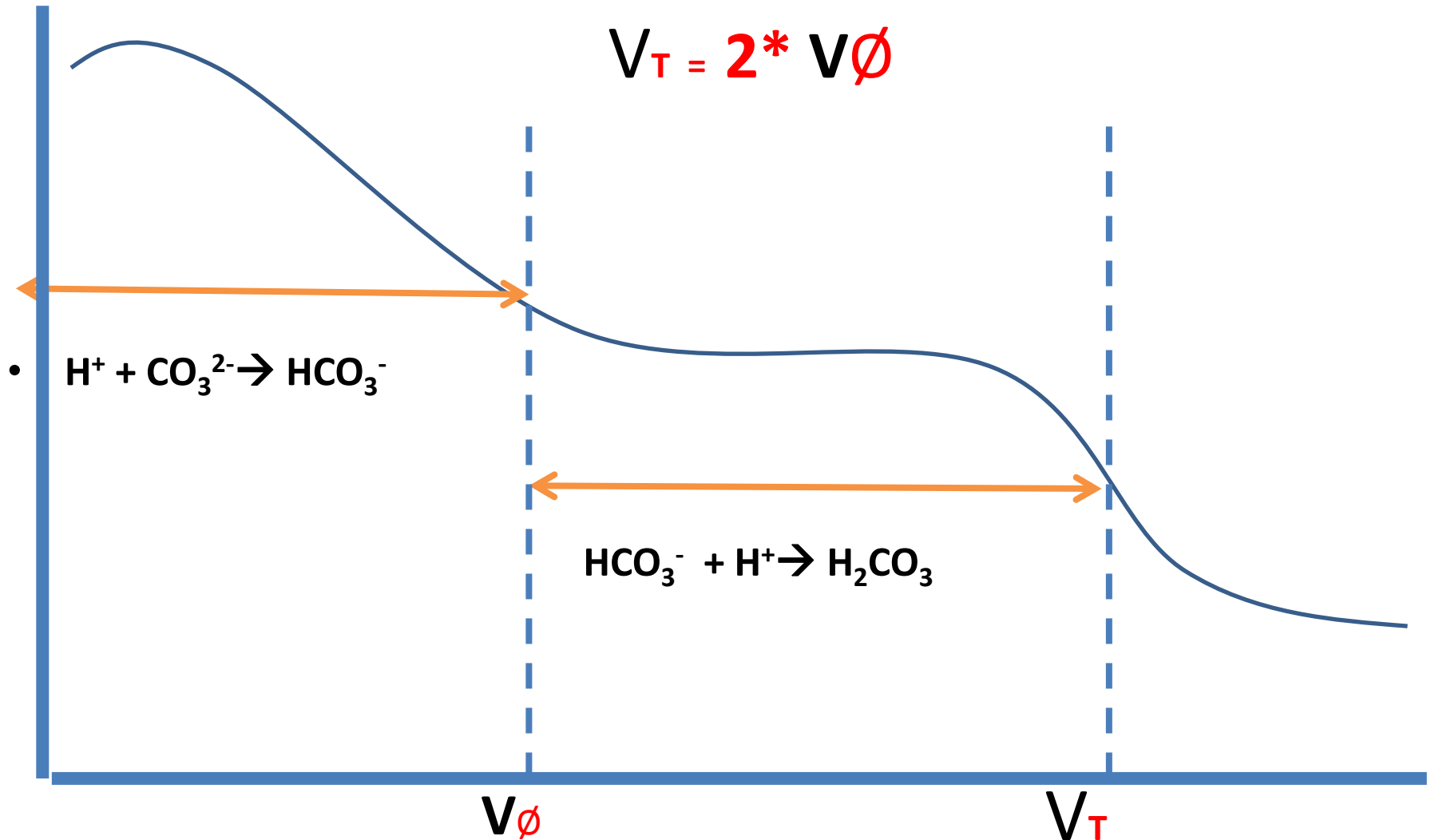
OH^- , HCO_3^- ve CO_3^{2-} Qələvilii



Sadece OH^- Alkalitesi
 HCO_3^- ve CO_3^{2-} Alkalitesi yok



Sade CO_3^{2-} (Karbonat) Qələvilii
 HCO_3^- ve OH^- Qələvilii yok



OH^- ve CO_3^{2-} (Karbonat) Qələvilii

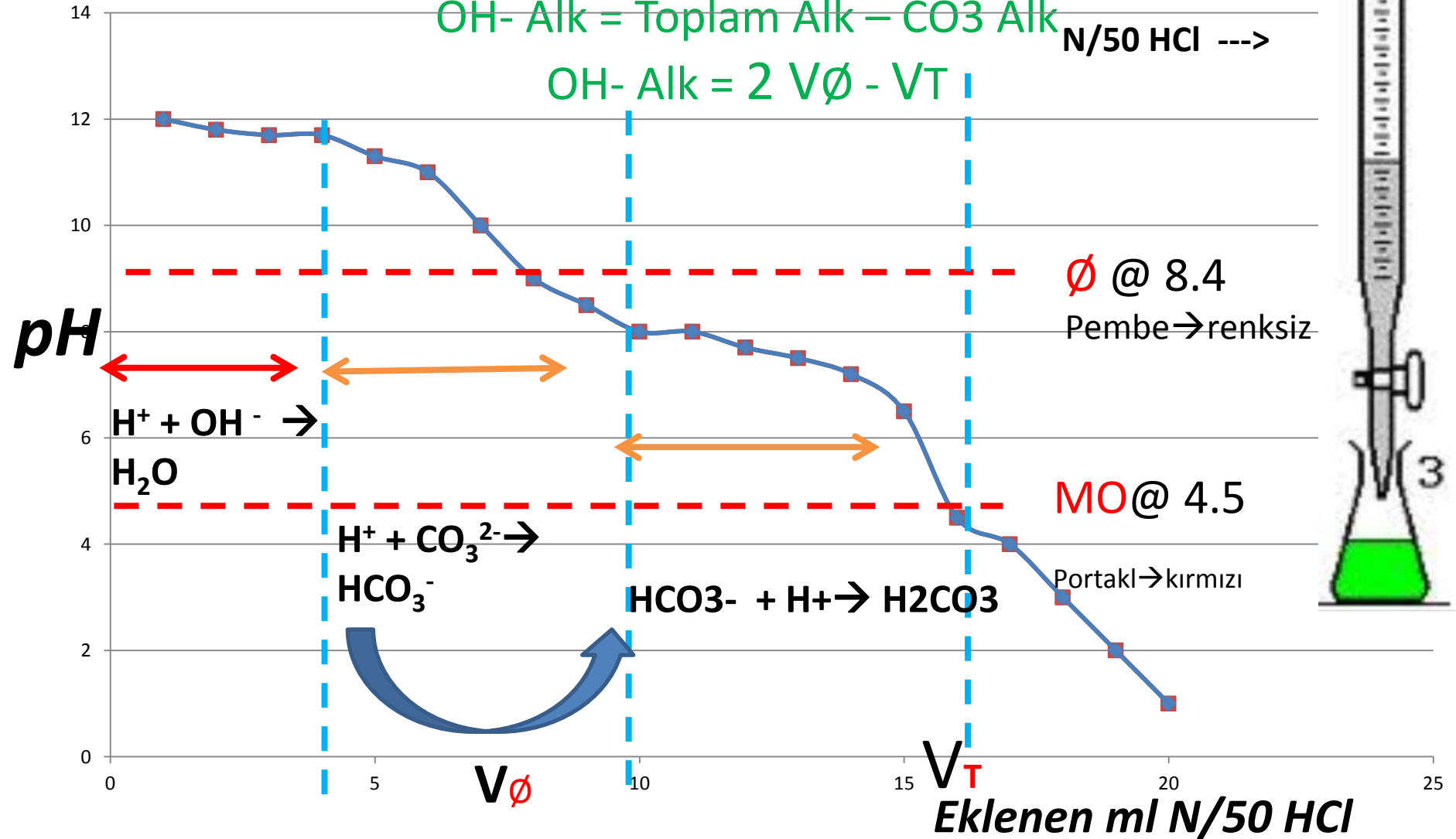
HCO_3^- Qələvili yok

CO_3^{2-} Qələvili = $2 * (V_T - V_\emptyset) * 1000 / \text{ml numune}$

$\text{OH- Alk} = \text{Toplam Alk} - \text{CO}_3 \text{ Alk}$

$\text{OH- Alk} = 2 V_\emptyset - V_T$

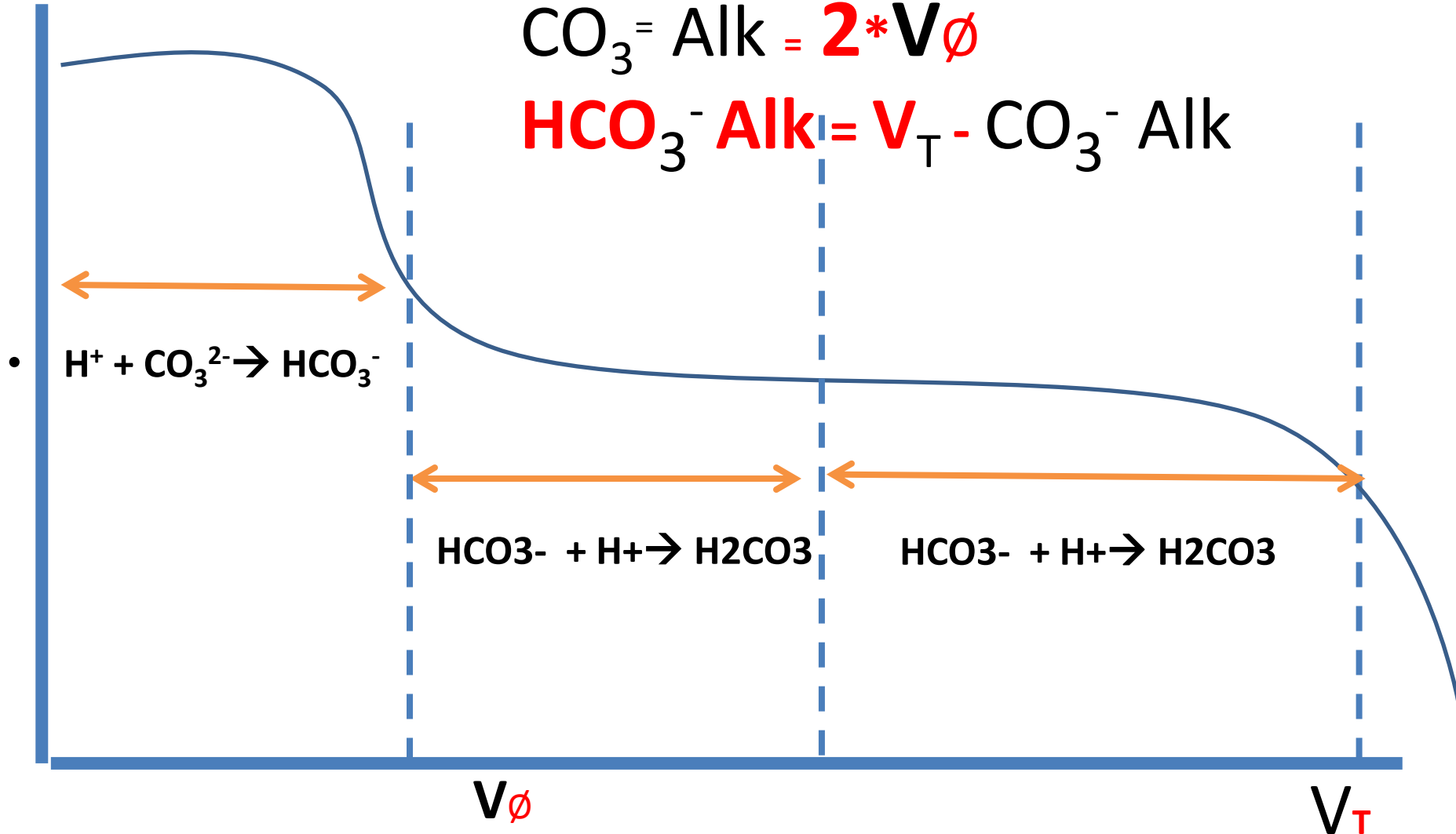
N/50 HCl ---->



CO_3^{2-} ve HCO_3^- Alkalinitesi OH^- Alkalinitesi yok

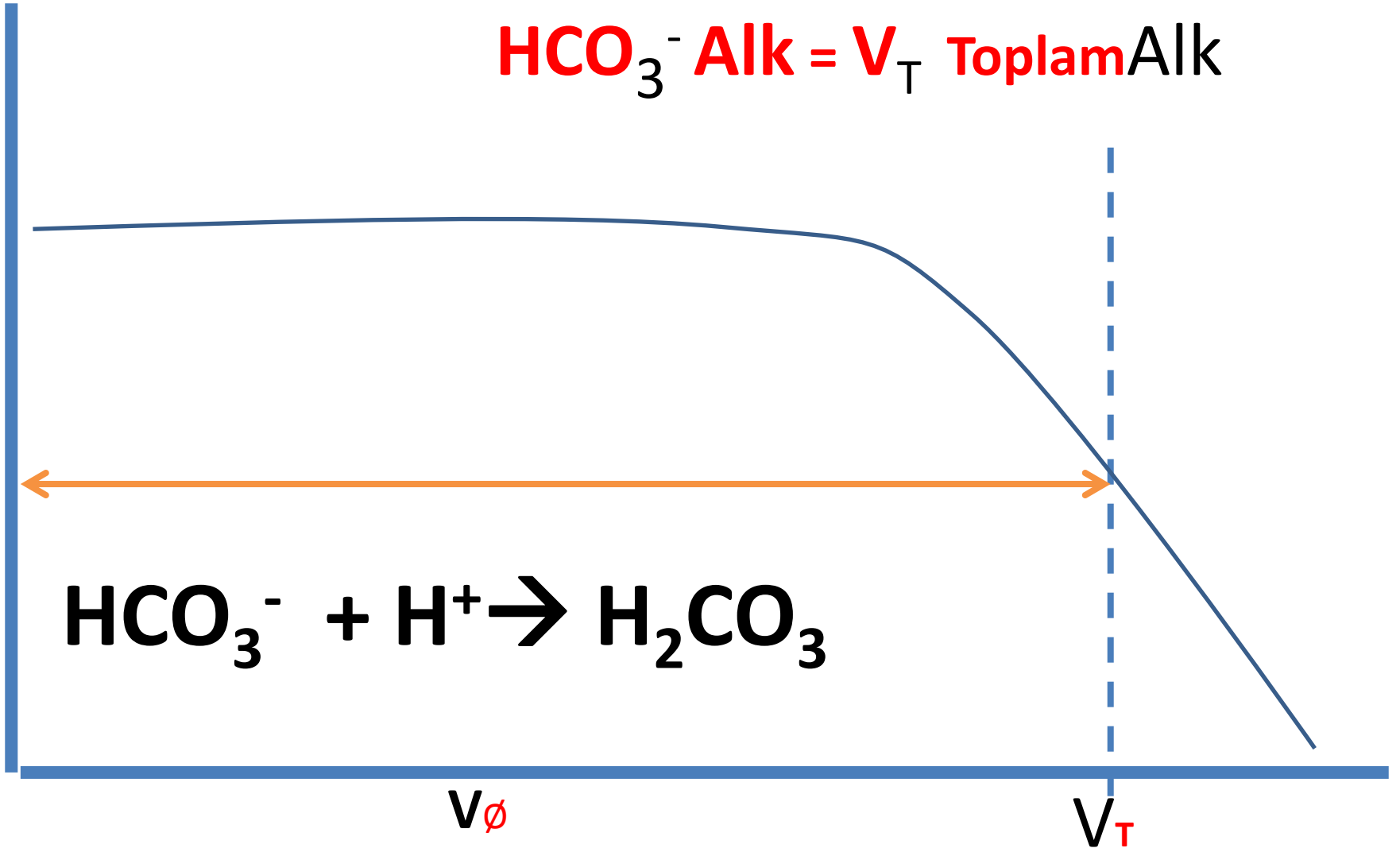
$$\text{CO}_3^{2-} \text{ Alk} = 2 * V_{\phi}$$

$$\text{HCO}_3^- \text{ Alk} = V_T - \text{CO}_3^{2-} \text{ Alk}$$

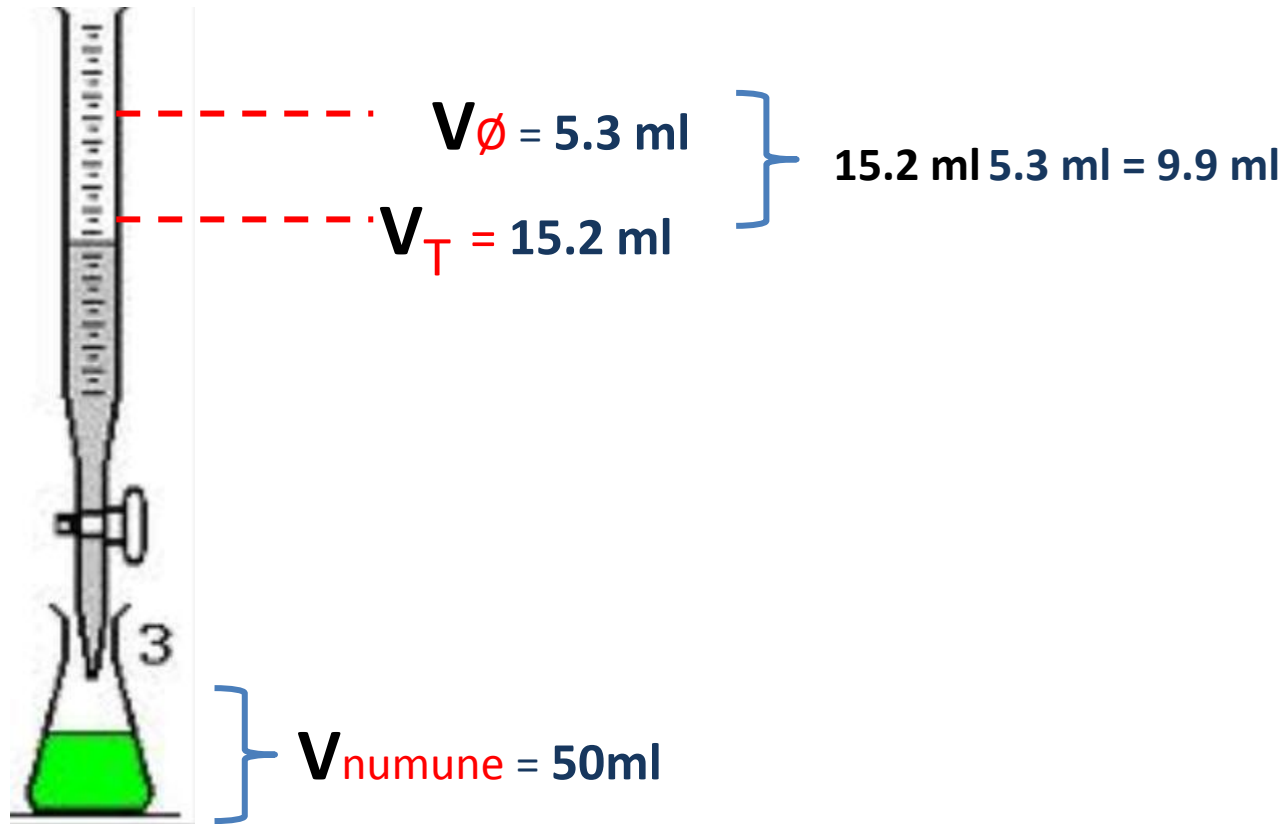


Sadece HCO_3^- Alkalitesi
 OH^- ve CO_3^{2-} Alkalitesi yok

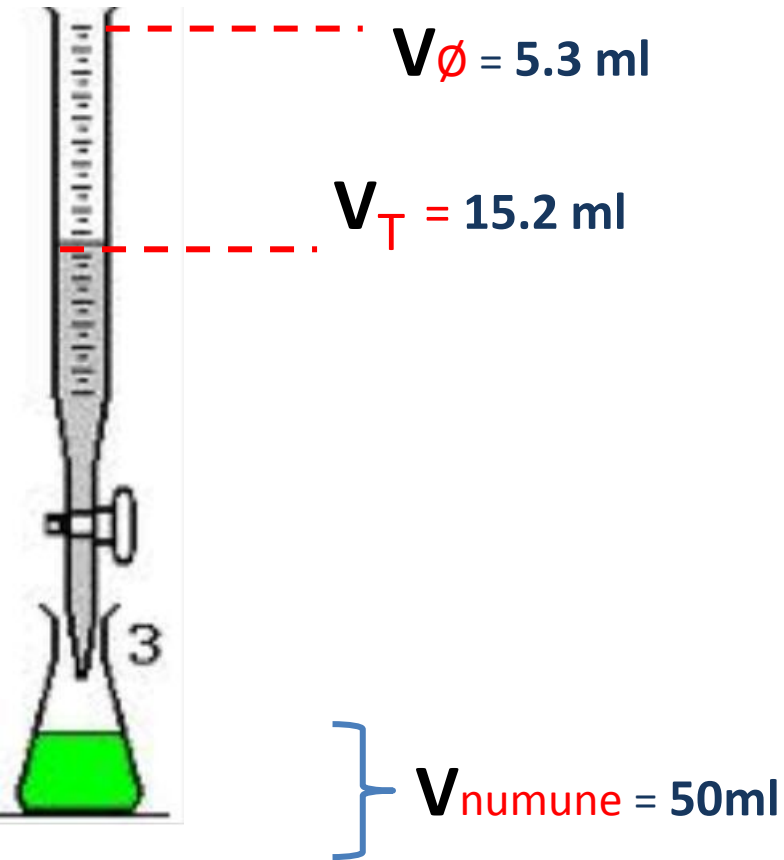
$$\text{HCO}_3^- \text{ Alk} = V_T \text{ Toplam Alk}$$



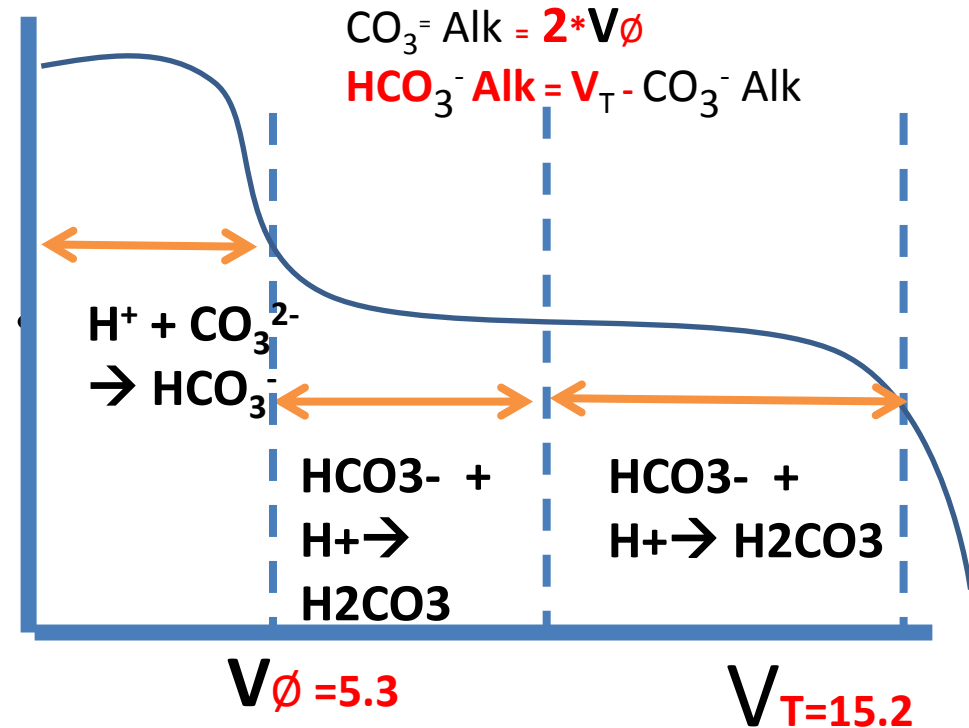
Misal: 50 ml su numunesi için 53 ml \emptyset
ve V_T için 15.2 ml, N/50 HCl kullanılıyor.
Suyun Alkalinitesi nedir ?



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 ve V_T için 15.2 ml, N/50 HCl kullanılıyor.
 Suyun Alkalinitesi nedir ?

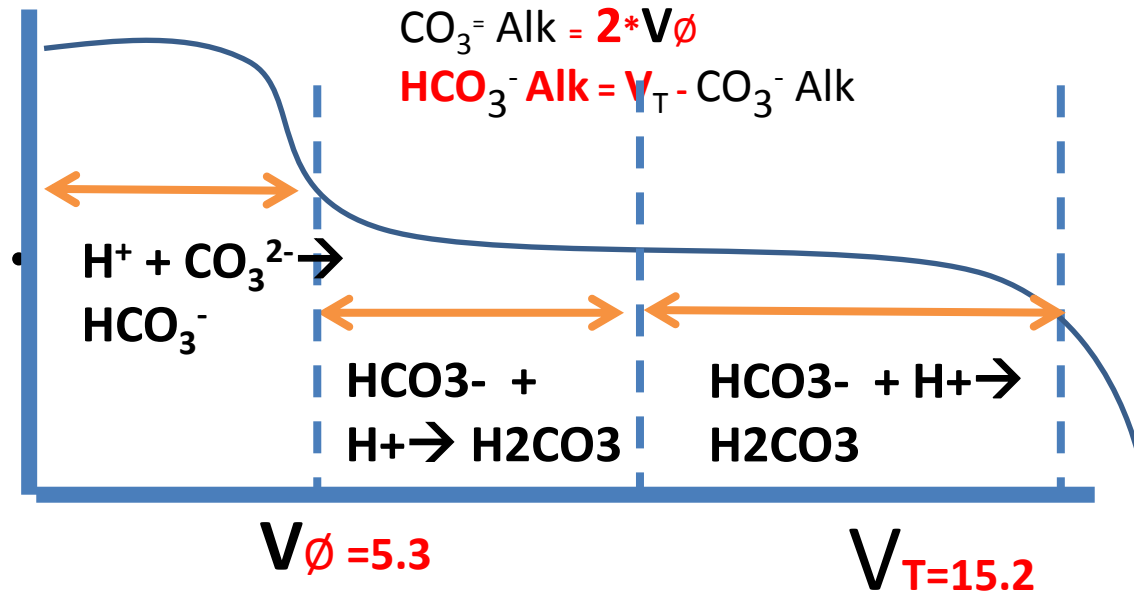


CO_3^{2-} ve HCO_3^- Alkalinitesi
 OH^- Alkalinitesi yok



- $\text{CO}_3^{2-} \text{ Alk} = 2 * 5.3 * 1000\text{ml}/50 \text{ ml}) = 212 \text{ mg/L CaCO}_3$
- $\text{HCO}_3^- \text{ Alk} = V_T - \text{CO}_3^{2-} \text{ Alk} = (15.2 - 2 * 5.3) * 1000\text{ml}/50 \text{ ml}) = 92 \text{ mg/L CaCO}_3$

CO_3^{2-} ve HCO_3^- Alkalinitesi
 OH^- Alkalinitesi yok



CO₂ in atmosphere

↑↓

CO₂ in surface waters

↑↓ + H₂O

H₂CO₃

↑↓ - H⁺

HCO₃⁻ bicarbonate ion

↑↓ - H⁺

CO₃²⁻ carbonate ion

