

**DETERMINATION OF TOTAL  
ALKALOID CONTENT IN CORTEX  
CHINAE  
(TITRIMETRIC)**

## Methods of determination of active substance in drugs:

- Gravimetric
- Titrimetric
- Volumetric
- Colorimetric
- Chromatographic (HPLC, GC)
- Spectrophotometric
- Polarimetric
- Biological

PN: *Cinchona succirubra* (Rubiaceae)  
DN: Cortex Chinae - Kınakına kabuğu

Alkaloid mixture (quinine-quinidine, cinchonine-cinchonidine)

The total alkaloid content is estimated as quinine and cinchonine.

**The alkaloids generally exist in the plant as salts of acids and sometimes as binded with tannins.**

Alkaloid extraction is carried out in two ways:

- 1) Water or aqueous alcohol containing dilute acid
- 2) Alkaline solution by means of an organic solvent

# EXPERIMENTAL PROCEDURE

Quinic acid  
Quinotannic Acid

**Cortex Chinae (1,25 g)**

↓ + 25% formic acid (2 ml)  
+ water (15 ml)

**extract in the water bath for 30 minutes with continuous stirring using erlenmeyer flask with cap**

↓ cool

+ chloroform (15 ml)  
+ ether (60 ml)  
+ 30% NaOH (5 ml)

↓ Shake for 1 min

+ **Gum tragacanth**(2 g)

↓ Shake for 1 min

**take the ether phase collected on the top**



**The ether phase is evaporated in water bath until 1-2 ml remains.**



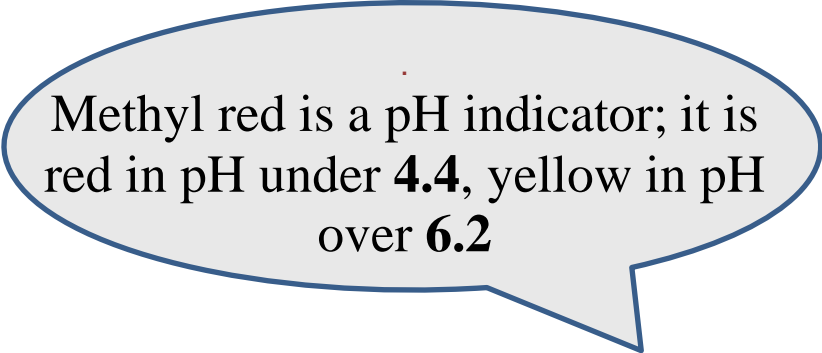
**Residue**



**+ ethanol (10 ml)  
+ boiled water (10 ml)  
+ methyl red (10 drops)**



**Titration up to red with 0.1 N HCl**



Methyl red is a pH indicator; it is red in pH under **4.4**, yellow in pH over **6.2**

# CALCULATIONS

1l	1N HCl	36.5 g
1l	0.1N HCl	3.65 g
1ml	0.1N HCl	<b>0.00365 g</b>

$$\begin{array}{r} \text{MA}_{\text{quinine}} = \text{quinidine} = 324.40 \text{ g} \\ \text{MA}_{\text{cinchonine}} = \text{cinchonidine} = 294.40 \text{ g} \\ \hline \text{Accepted average molecular weight for alkaloids in the drug} = \mathbf{309.4 \text{ g}} \end{array}$$

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1 molecule HCl reacts  
 36.5 g of HCl reacts  
 0.00365 g of HCl reacts

1 molecule of alkaloid  
 309.4 g of alkaloid  
 30.94 mg of alkaloid

1 ml 0.1 N HCl is equivalent 30.94 mg of alkaloid  
 A ml 0.1 N HCl is equivalent X **mg** of alkaloid

$$X \text{ mg} = X \cdot 10^{-3} \text{ g}$$

1,25.. g drog                       $X \cdot 10^{-3}$  **g** of alkaloid  
 100 g drog                              B g of alkaloid

B = % alkaloid content