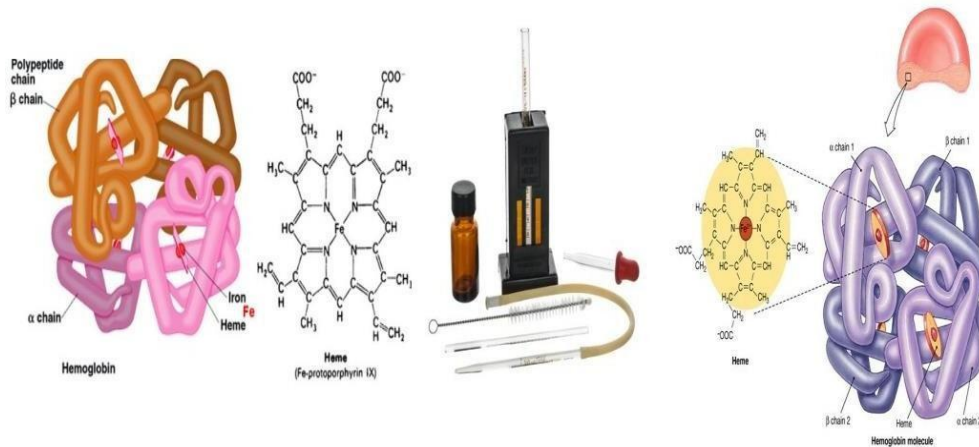




## Human physiology

### Cyanmethemoglobin Method

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## Hemoglobin

Hemoglobin, the main component of the red blood cell, functions in the transportation of oxygen and CO<sub>2</sub>. Hemoglobin consists of 1 molecule of globin and 4 molecules of heme (each containing 1 molecule of iron in the ferrous state). Globin consists of 2 pairs of polypeptide chains. In the hemoglobin molecule, each polypeptide chain is associated with 1 heme group; each heme group can combine with 1 molecule of oxygen or CO<sub>2</sub>.

Hemoglobin carries oxygen from places of high oxygen pressure (lungs) to places of low oxygen pressure (tissues), where it readily releases the oxygen. Hemoglobin also returns CO<sub>2</sub> from the tissues to the lungs.

## **Methods**

Methods for hemoglobinometry can be grouped into **4 main** classes depending on the basic technique employed with variants within each class:

1. Colorimetric Methods
2. Gasometric Methods
3. Specific Gravity Methods
4. Chemical Methods.

The method of choice for hemoglobin determination is the cyanmethemoglobin method (This is a type of colorimetric method). The principle of this method is that when blood is mixed with a solution containing potassium ferricyanide and potassium cyanide, the potassium ferricyanide oxidizes iron to form methemoglobin. The potassium cyanide then combines with methemoglobin to form cyanmethemoglobin, which is a stable color pigment read photometrically at a wavelength of 540nm.

### **There are Three advantages of the cyanmethemoglobin method are:**

1. measures all forms of hemoglobin except sulfhemoglobin
2. can be easily standardized
3. cyanmethemoglobin reagent (also called Drabkin's solution) is very stable

## **Normals**

women 12 - 16 g/100 ml blood (g/dl)

(g%)men 14 - 18 g\100 ml blood (gm\dl)

newborn 14 – 20

## **Cyanmethemoglobin Method for Determining**

### **Hemoglobin Concentration Procedure: -**

1. Label a series of tubes as follows:

BLA

NK

Lo

STD

Norm

STDHi

STD

Norm

CONTROL

Hi

CONTROL

Patient (PT)

2. Pipette 5 ml of Cyanmethemoglobin reagent into each tube. Add 20  $\mu$ l of the appropriate sample into each tube. Do not add anything

other than the Cyanmethemoglobin reagent to the reagent BLANK.

**3.** Allow tubes to stand for 10 minutes.

**4.** Read Absorbance (A) in the spectrophotometer at 540 nm, zeroing the spectrophotometer with the BLANK solution.

**5.** Plot Absorbance vs. Hemoglobin Concentration in grams % on linear graph paper.