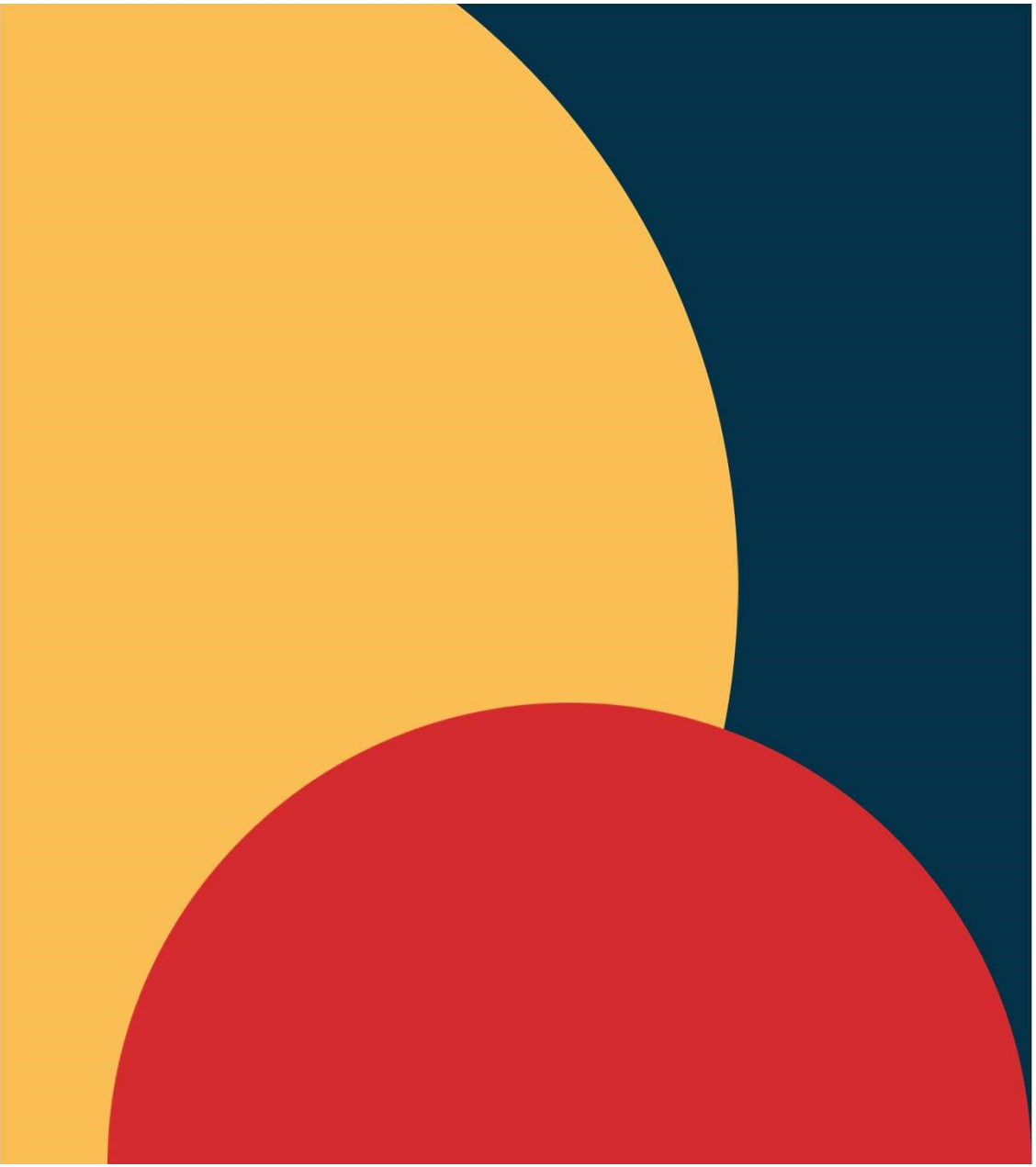


Use of AHAs and BHAs in skincare

AHAs

AHAs are a group of plant and animal-derived acids with one hydroxyl group attached to the **alpha** position of the acid, primarily used as **exfoliators**.

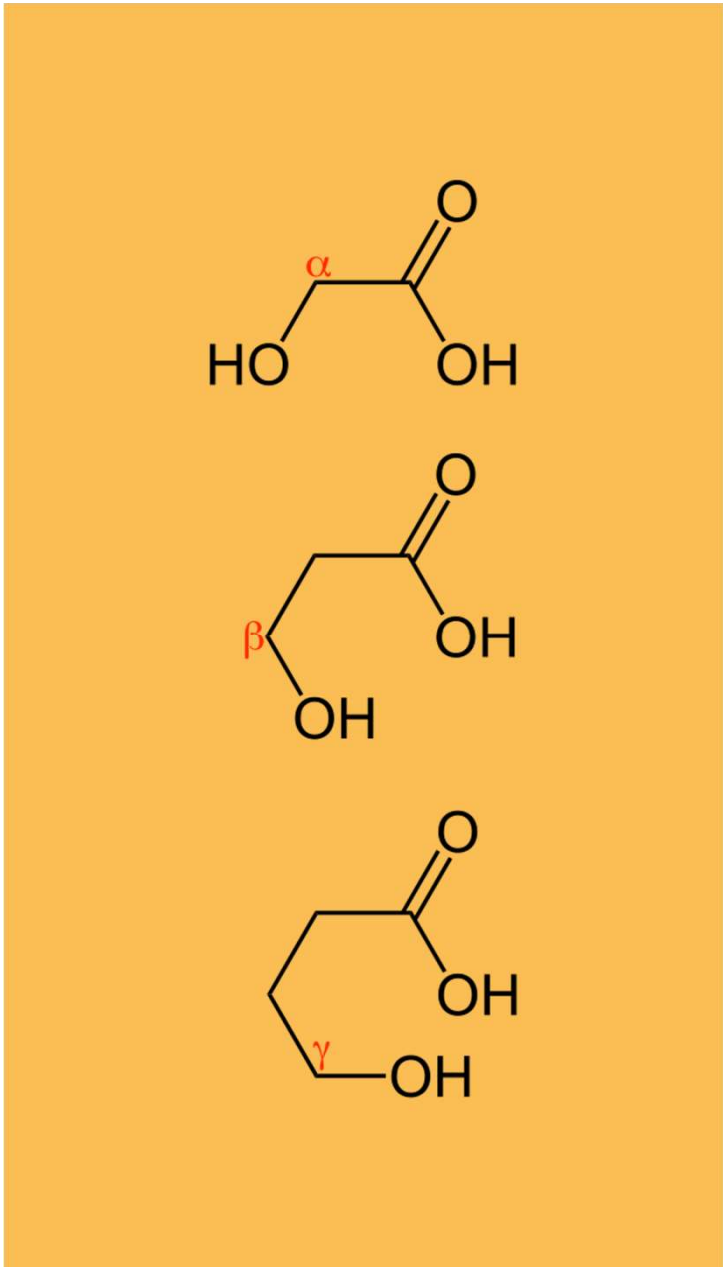
Used in:

Serums

Toners

Creams

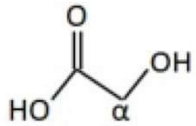
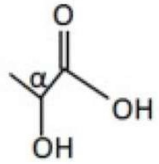
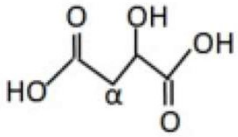
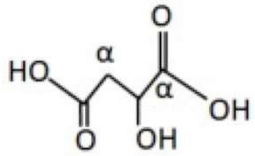
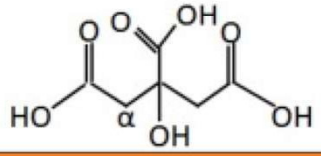
Occasional concentrated treatments via chemical peels



Royal jelly: **milky secretion produced by worker honeybees.**

Sources of AHA

1. **C**itric acid (from citrus fruits) to neutralize the skin's pH levels.
2. **G**lycolic acid (from sugar cane) for exfoliation.
3. **H**ydroxycaproic acid (from royal jelly)
4. **H**ydroxycaprylic acid (from animals)
5. **L**actic acid (from lactose or other carbohydrates) for exfoliation and anti-aging effects.
6. **M**alic acid (from fruits esp apple) makes other acids more effective.
7. Tartaric acid (from grapes) for alleviating signs of sun damage and acne.

AHAs		structure	Molecular weight
Glycolic acid	C_2H4O3		72
Lactic acid	$C_3H_6O_3$		90
Malic acid	$C_4H_6O_5$		134
Tartaric acid	$C_4H_6O_6$		150
Citric acid	$C_6H_8O_7$		192

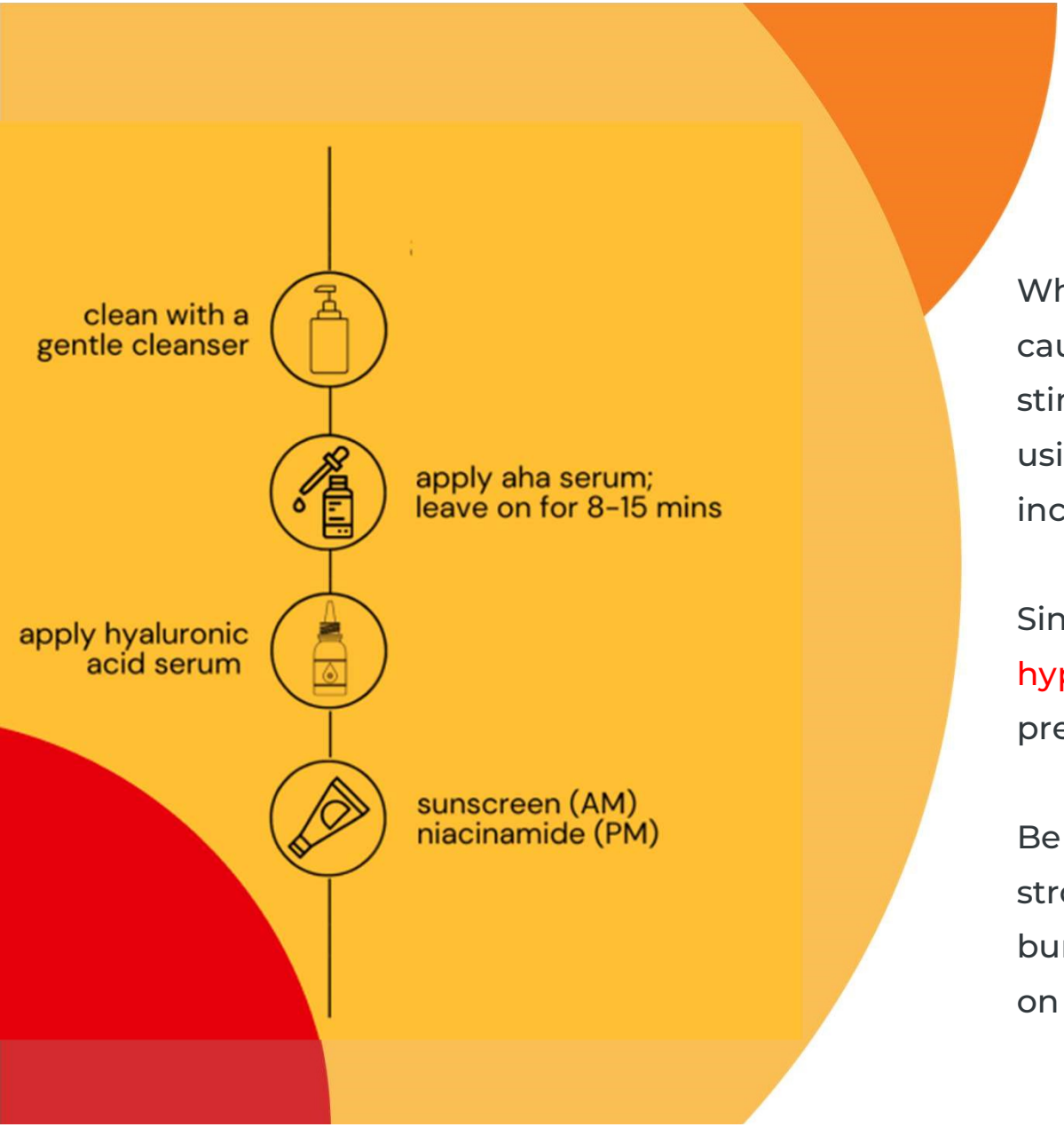
Benefits of AHA

Promotes collagen and blood flow: **Collagen is a protein-rich fiber that helps keep your skin plump and smooth. High concentrations of AHA penetrate the skin more easily and cause epidermal separation, epidermolysis, and stimulation of collagen synthesis in the dermis.**

Anti-aging: **increases skin thickness and hydration, correcting discoloration from scars and age spots, decreasing fine wrinkles**

Prevents acne breakouts: **treats atrophic (indented) acne scars, most useful for mild, superficial acne scars**

Brightens complexion: **AHAs with glycolic acid can help break down skin cell accumulation, while products with citric acid can brighten your skin even further.**



How to use AHA?

While AHAs have hydrating properties, they may still cause irritation including redness, peeling, and stinging as they are actives. Hence, it is advised to start using the product once or twice a week and slowly increasing in frequency.

Since deeper skin tones are prone to hyper- and hypopigmentation in response to damage, extra precaution is advised.

Be on the lookout for signs that the product is too strong or that one is using it too frequently, such as burning, redness, irritation, and dryness, cutting down on the frequency of usage.

Hypo pigmentation + Hyper pigmentation

NEW FACE
BEAUTY CENTER

Hypo pigmentation

What Is It: hypopigmentation is the loss or underdevelopment of melanin

What Is It Caused From: trauma, injury, or chronic condition (albinism, vitiligo)

Facial Treatments: in some studies, laser treatments have shown to increase pigment

Hyper pigmentation

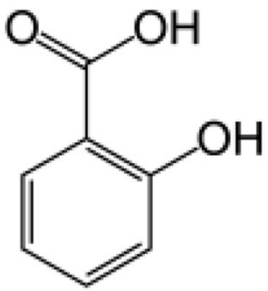
What Is It: hyperpigmentation is an excess production of melanin

What Is It Caused From: everything from acne to sun damage

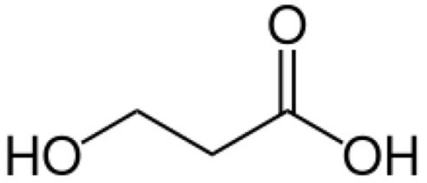
Facial Treatments: laser, chemical peels, microneedling

BHAs

BHA is an organic compound that contains a carboxylic acid functional group and hydroxy functional group separated by two carbon atoms. They are closely related to alpha hydroxy acids



In cosmetics, the term beta hydroxy acid refers specifically to **salicylic acid**, which is used in acne treatments.

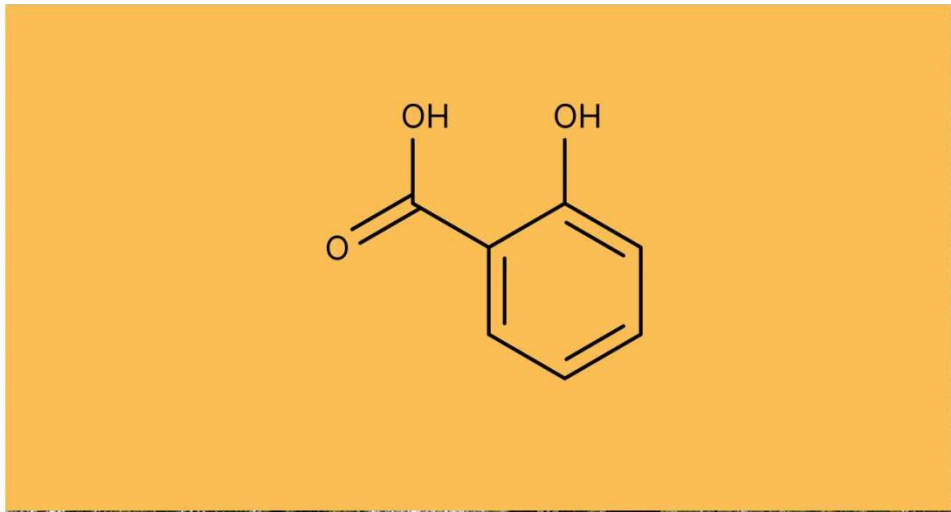


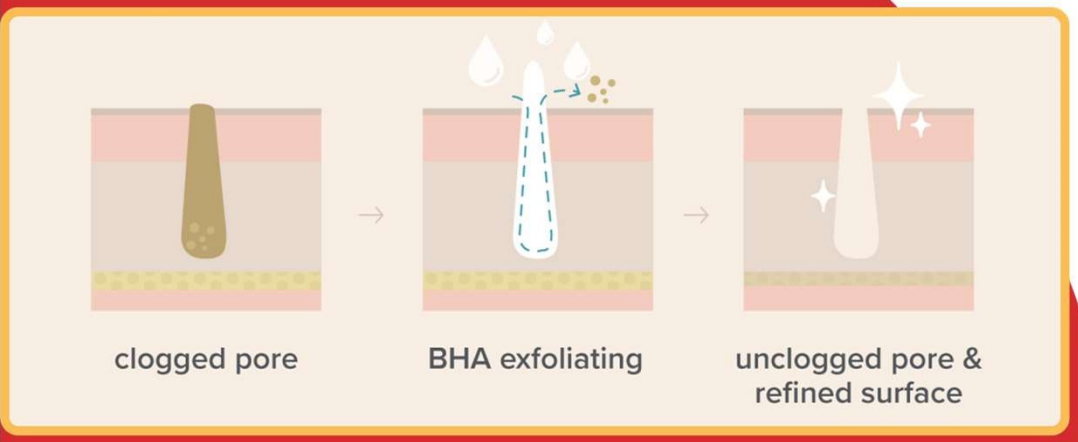
Salicylic Acid

Salicylic acid is a **beta hydroxy acid**.

It’s well-known for reducing acne by exfoliating the skin and keeping pores clear.

Salicylic acid is derived from willow bark





Benefits of BHAs

Salicylic acid is a **keratolytic**, it encourages cellular turnover and helps to shed off dead skin cells, which in turn can improve skin dullness and texture.

Prevents whiteheads and blackheads

Removes excess oil

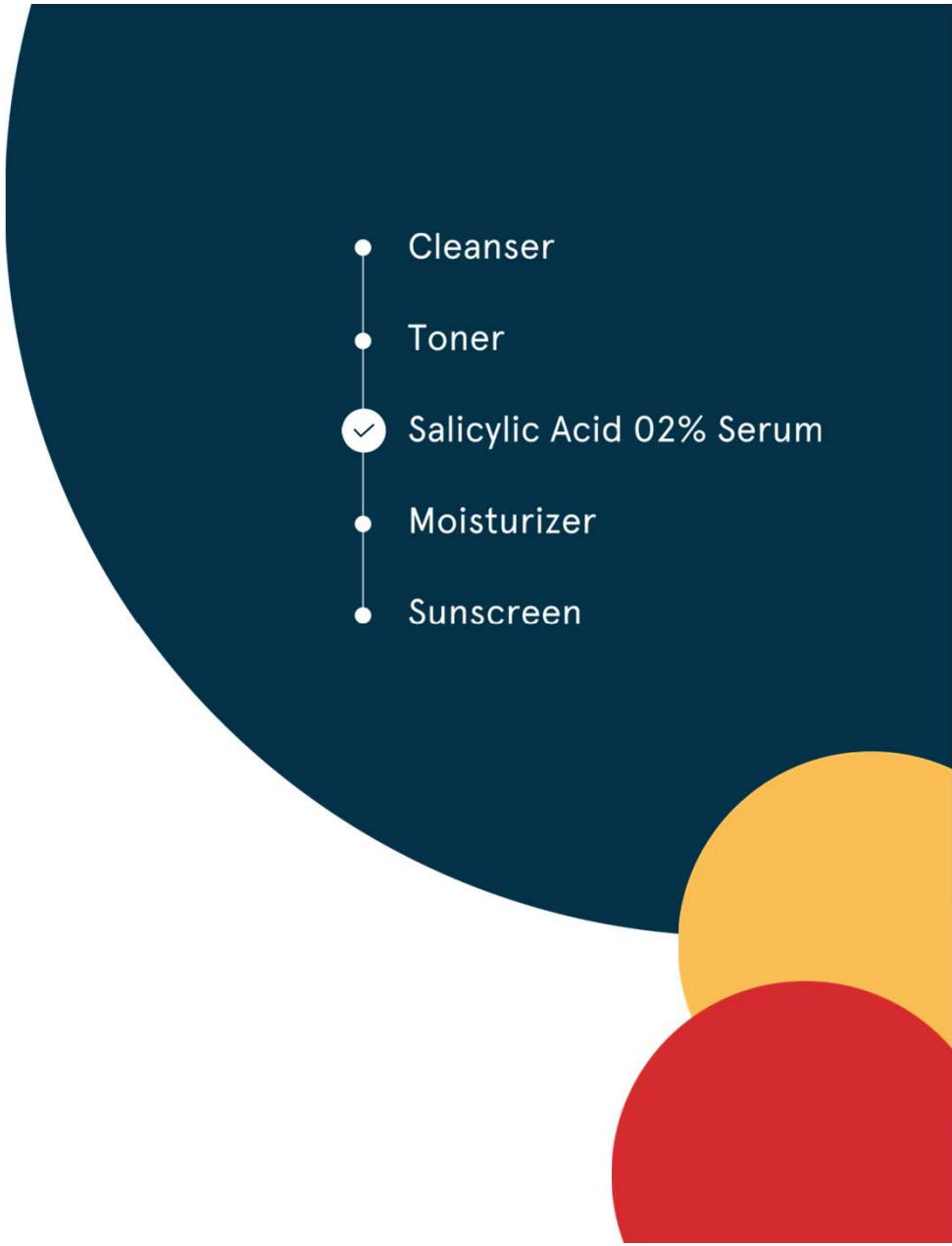
Minimizes pore size

How to use Salicylic Acid

The recommended concentration of a salicylic acid product varies from person to person

Use salicylic acid in moderation until you know your skin can tolerate it.

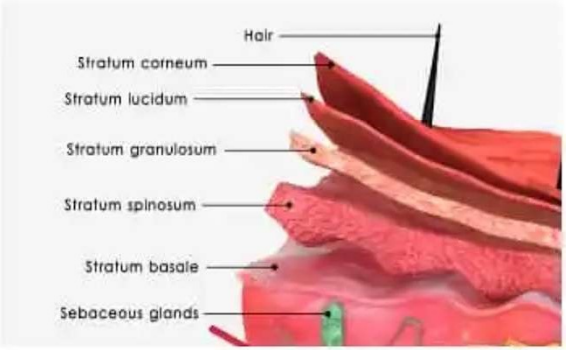
The primary negative side effect of salicylic acid is its ability to irritate and dry skin in those who are very sensitive or those who overuse it



Working Principles

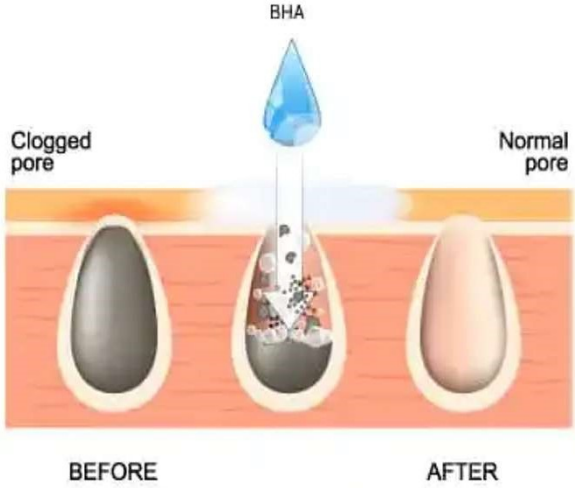
AHA's

Glycolic acid works by removing the stratum corneum to promote the production of collagen and elastin to combat fine lines and wrinkles, and can also break up melanin pigments to lighten skin.



BHA's

It is lipid soluble, so salicylic acid is ideal for those with oily or acne-prone skin because of its ability to deeply penetrate clogged pores to remove dead skin cells and other debris, the patient is left with clear, healthy skin.



AHA v/s BHA

There are multiple AHAs.

AHAs may be more appropriate for age-related **skin concerns, such as fine lines and wrinkles.**

AHAs take off the dead skin that's sitting on the top layer of your face.

Has effects on collagen and procollagen **production. These are substances that can improve the appearance of photoaged skin.**

Salicylic acid is the only BHA.

BHAs might be best if you have sensitive, acne-prone **skin.**

BHAs are more aggressive, loosening up the bonds that hold dead skin together for a much deeper cleaning.

The antibacterial effects **of BHAs make them appropriate ingredients for acne products.**

How to use acids correctly

Always patch test any new product

AHAs and BHAs should be used in different ways.

Alternative usage is recommended for AHAs, unless prescribed by a dermatologist otherwise

When using AHAs in your routine, avoid products containing vitamin C and retinol immediately after

Always follow-up with sunscreen when used during the day

If you feel any product is really not suiting your skin, stop using it immediately

AHA/BHA in skin-care products

Minimalist 10% AHA BHA Exfoliating Serum For Beginners | AHAs (Lactic Acid & Glycolic Acid) & BHA (Salicylic Acid) Serum

Dot & Key 10% AHA + 2% BHA Hydro Peel Glow Potion, 30ml, Exfoliating Serum with Glycolic, Lactic acids for skin glow, Parabe...

★★★★☆ 758

THE ORDINARY Aha and Bha Peeling Solution, 30 ml

★★★★☆ 523

Skin Medica AHA/BHA Cream 2 Ounce

Cream

Mario Badescu Glycolic Foaming Cleanser, 6 oz.

Foam

FORENSIC ANALYTICAL CHEMISTRY

Dayanand Shetty

Aditya Srivastava

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Fredricks

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ACP Pradyuman

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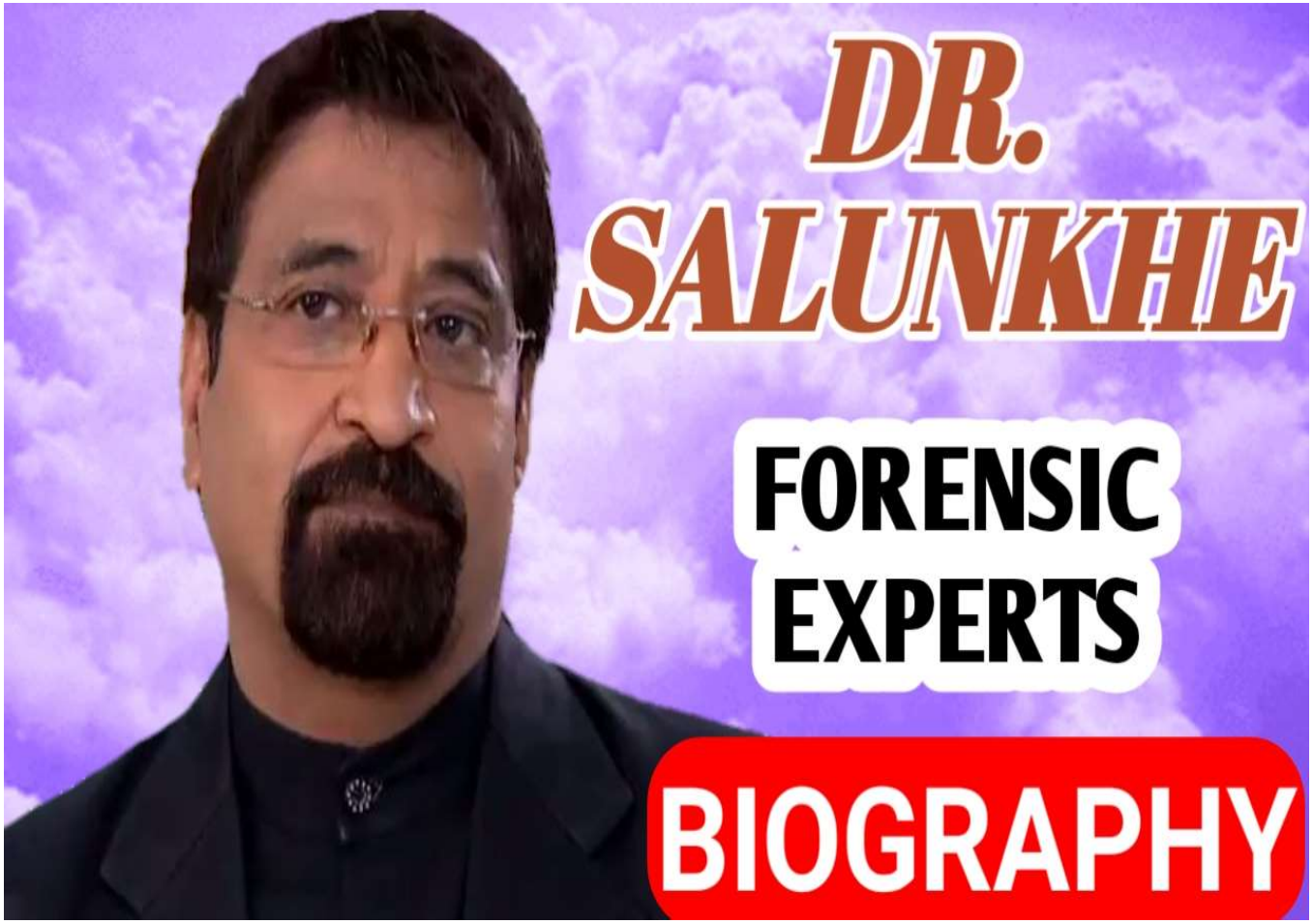
CONTENT

- INTRODUCTION
- DEFINITION
- FORENSIC ANALYTICAL CHEMISTRY
- 1. PROHIBITED DRUG ANALYSIS
- 2. BOMBS & EXPLOSIVES ANALYSIS
- 3. BLOOD ANALYSIS
- 4. HAIR ANALYSIS
- CONCLUSION
- REFERENCES


DR.
SALUNKHE
FORENSIC
EXPERTS
BIOGRAPHY

INTRODUCTION

- KEY CONCEPT IN FORENSIC SCIENCES-

"LOCARD'S EXCHANGE PRINCIPLE"

Whenever a criminal comes in contact with a person or object there is a cross transfer of evidence

DEFINITION

- **FORENSICS** – The study of evidence discovered at a crime scene and used in a court of law.

- **FORENSIC SCIENCES** - Application of scientific knowledge and methodology to legal problems and criminal investigation.

It encompasses many different fields of science, including chemistry, biology, toxicology, engineering, medicine, and pathology.

- **CRIMINALISTICS** – Refers to the scientific collection and analysis of physical evidence.
  Physical evidence includes the abuse of illegal drugs, blood, bombs & explosives, hair, fibers & fingerprints etc.
- **FBI (FEDERAL BUREAU OF INVESTIGATION,U.S) -** Law enforcement agency operates criminal labs that perform scientific studies of evidence.
- **NIA (NATIONAL INVESTIGATION AGENCY, INDIA)**

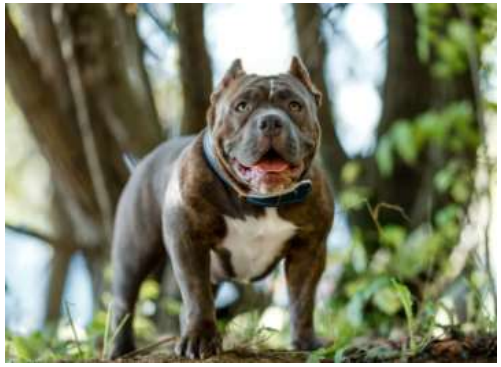
- Defined as analytical chemistry pertains to Law.

  The task of FAC is to examine the **chemical nature and composition** of various specimens such as drugs, blood, poison, bombs, and explosives etc.

- Examination of the material may be **Quantitative or Qualitative.**

How to Stop an Assassin: The Poison-proof Silverware That Could Save Your Life (Maybe)

Who will not Assassinate you?



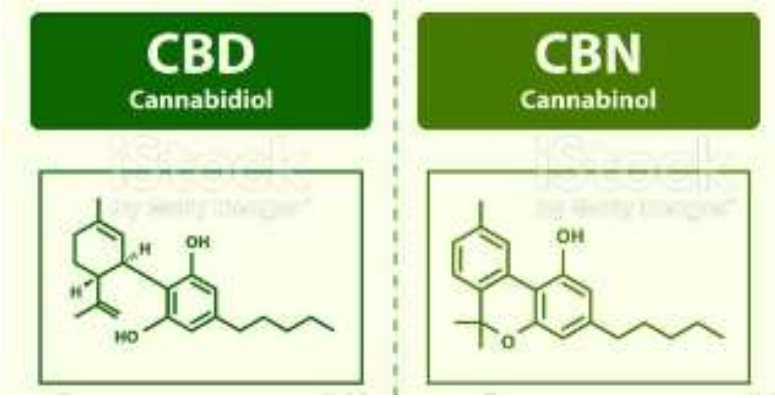
STAGES IN PRACTICE OF FAC

- *COLLECTION or RECEPTION OF SPECIMEN*
- Guiding principles - (sufficiency, standard, labelling and sealing).

- *ACTUAL EXAMINATION*.
- *COMMUNICATION IN THE RESULT OF EXAMINATION.*

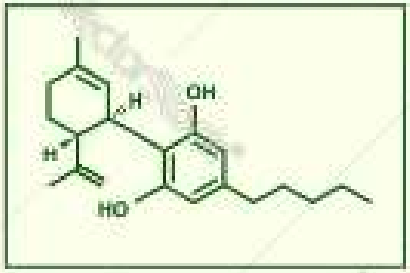
- *COURT APPEARANCE* (Forensic scientists often present expert testimony to courts).

- **MARIJUANA** (*Cannabis sativa*)- The three main chemical components of marijuana is
- Tetrahydrocannabinol (THC), cannabinol (CBN) & cannabidiol (CBD).



CBD vs CBN

CBD
Cannabidiol

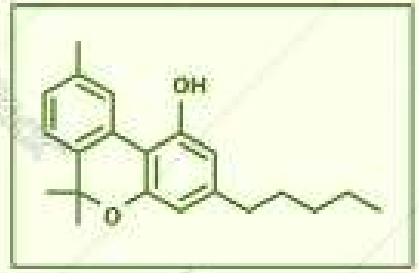


Chemical Formula
- $C_{21}H_{30}O_2$

Molecular Weight
- 314.46 g/mol

Medical Benefits
- anticancer
- antiemetic
- anti-inflammatory
- antidepressant
- antipsychotic

CBN
Cannabinol



Chemical Formula
- $C_{21}H_{26}O_2$

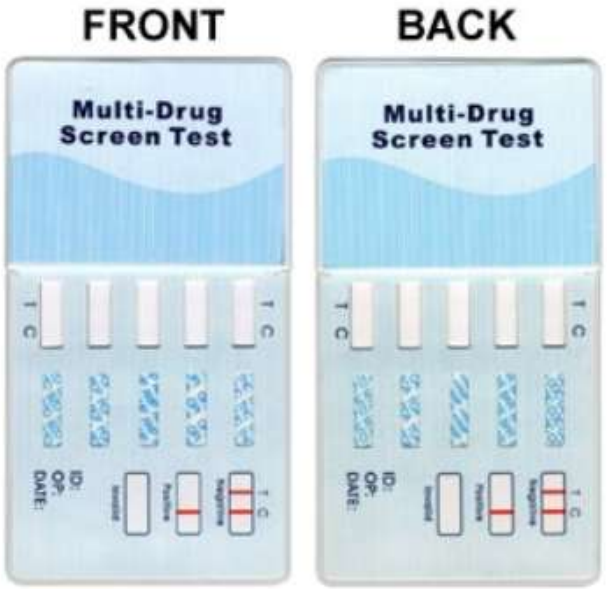
Molecular Weight
- 310.43 g/mol

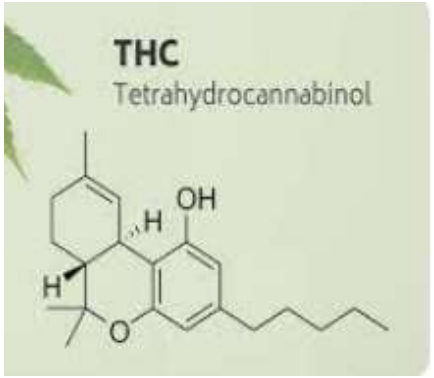
Medical Benefits
- antibacterial
- anti-inflammatory
- neuroprotectant
- antiemetic
- appetite stimulaton

PRILIMINARY TEST – Microscopic examination "crystalith hair of marijuana seeds look like a bear claw"

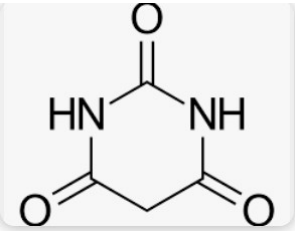
CONCLUSIVE TEST – Presence of THC.

Shake the THC with light petroleum(60-80 ◦C) and filter. To filtrate add solution of HCL in ethyl alcohol, at the junction a red coloration appears. After shaking upper layer becomes colorless and lower layer acquires pink color, which disappears on addition of water.





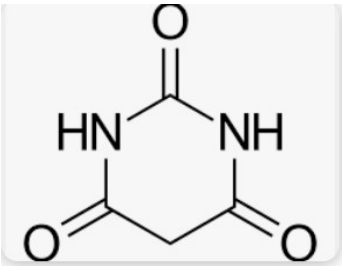
- **BARBITURATES** – Salts of malonyl esters.

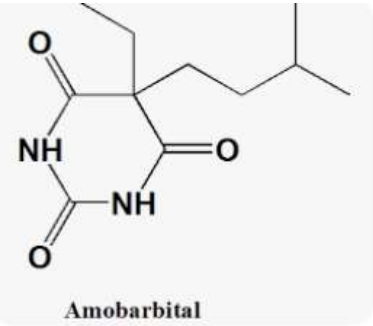


WAGENAAR'S *TEST (copper sulphate-ethylene diamine*)-Best test for Barbiturates, because it forms distinctive crystals with most barbiturates.

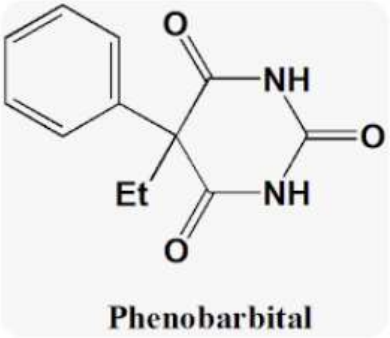
AMYTAL (amobarbital)- Light blue needles in a form of stars.

PHENOBARBITAL- Crystals in a shape of rosette fine needles.





Amobarbital



Phenobarbital

PROHIBITED DRUGS (Contd..)

- **INSTRUMENTAL METHODS FOR DRUG ANALYSIS**

  Includes UV-Vis, GC-MS.

- GC-MS is most commonly used.

  e.g. methamphetamine.

Amphetamine and dextroamphetamine combination is used to treat attention-deficit hyperactivity disorder (ADHD) and narcolepsy (uncontrollable desire for sleep or sudden attacks of deep sleep). These two medicines belong to the group of medicines called central nervous system (CNS) stimulants.

Amphetamine and dextroamphetamine combination works in the treatment of ADHD to increase attention and decrease restlessness in patients who are overactive, cannot concentrate, or are easily distracted. It is used as part of a total treatment program that also includes social, educational, and psychological therapy.

Wikipedia

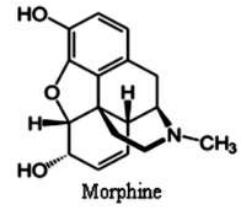
ium - Wikipedia

Alcohol and Drug Foundation

Opium - Alcohol and Drug Foun...

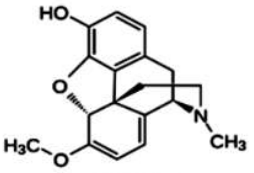
The Indian Express

Jodhpur arrested with 136.03 kg op

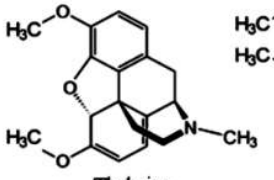


Morphine

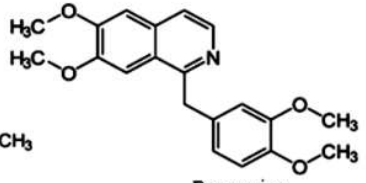
Codeine



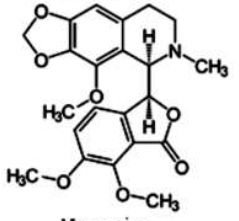
Oripavine



Thebaine



Papaverine



Noscapine

Wiktionary

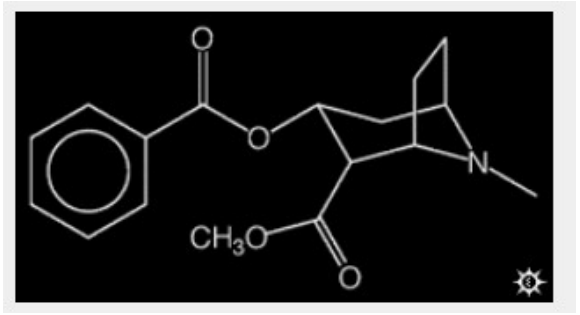
cocaine - Wiktionary

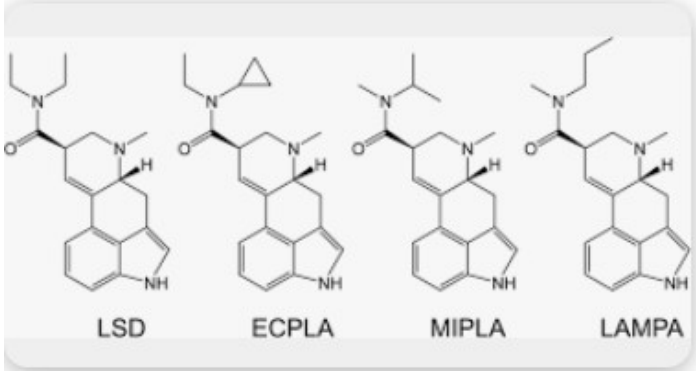
The Lancet

Effective drug therapy for cocaine ...

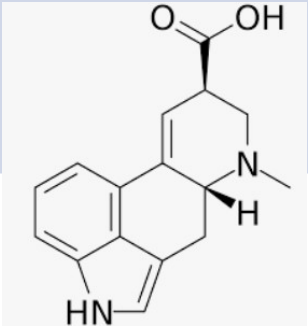
Duke Health

New Ingredient in Cocaine Vaccine ...





PROHIBITED DRUGS(Contd..)

DRUGS	TEST USED	COLOUR OF REACTION
OPIUM AND DERIVATIVES	MARQUIZ REAGENT (Mixture of formaldehyde & conc.H_2SO_4)	PURPLE COLOUR
COCAIN	SCOTT TEST (Cobalt thiocyanate)	BLUE PRECIPITATE
LSD (LYSERGIC ACID DIETHYLAMIDE)	PABA (Para- Aminobenzoic acid) 	PURPLE COLOUR

- The need of study of bombs & explosives by forensic personnel mainly relates to mass murder cases, where obviously bombs are the idea weapons.

- A timer or remote control device used to start the primary charge or spark, which then ignites the gas inside the bomb, triggered a much larger, high powered blast which causes the damage.

- Explosion is endothermic reaction

- Noble gases and Alkali metals are the some of most reactive elements in the periodic table and their compounds are likely bomb materials.

  e.g. *basic soda bomb* – uses the sodium bicarbonate (sodium compound), subsequently are alkali metals.

- **BOMB DEPOSITS** – Investigators search for possible fragments of the bomb by the agents, that result by changing the color when it comes in contact with fuel.

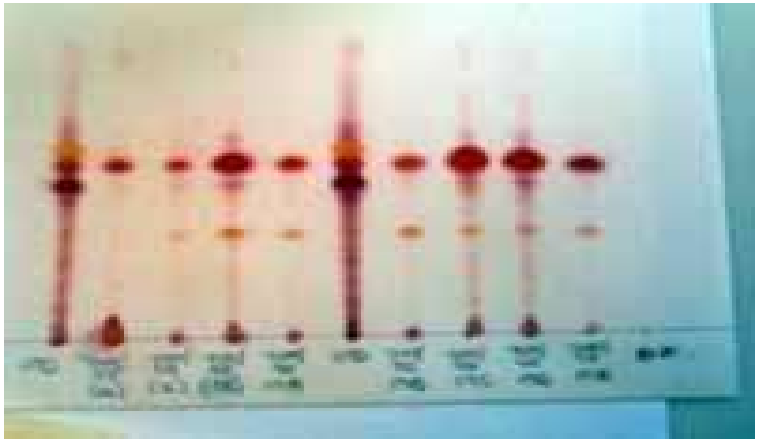
BOMBS AND EXPLOSIVES(Contd..)

- **FRAGMENTS** – Carry traces of unburned fuel are taken back to the laboratory and carry out the microscopic examination and which gives the shapes of fuel particles for the identification.

- Then these particles are washed in water & solubilized in acetone form the inflammable liquid.

- The solution is then screened and analyzed using the mass spectrometry.

- Mass-spectrometry identifies the chemical composition.
- Another method is thin-layer chromatography – identifies the different components.
- A piece of bomb simply leads to determining where the bomb was manufactured.



- BLOOD – Circulating tissue in our body
- SERUM – If blood clotted, a straw-colored liquid will separate from the blood.
- PLASMA – If anti-coagulant is added to the blood and allowed for some time a straw-colored liquid separates out.
- Plasma contains the fibrinogen, whereas serum contains the fibrin.

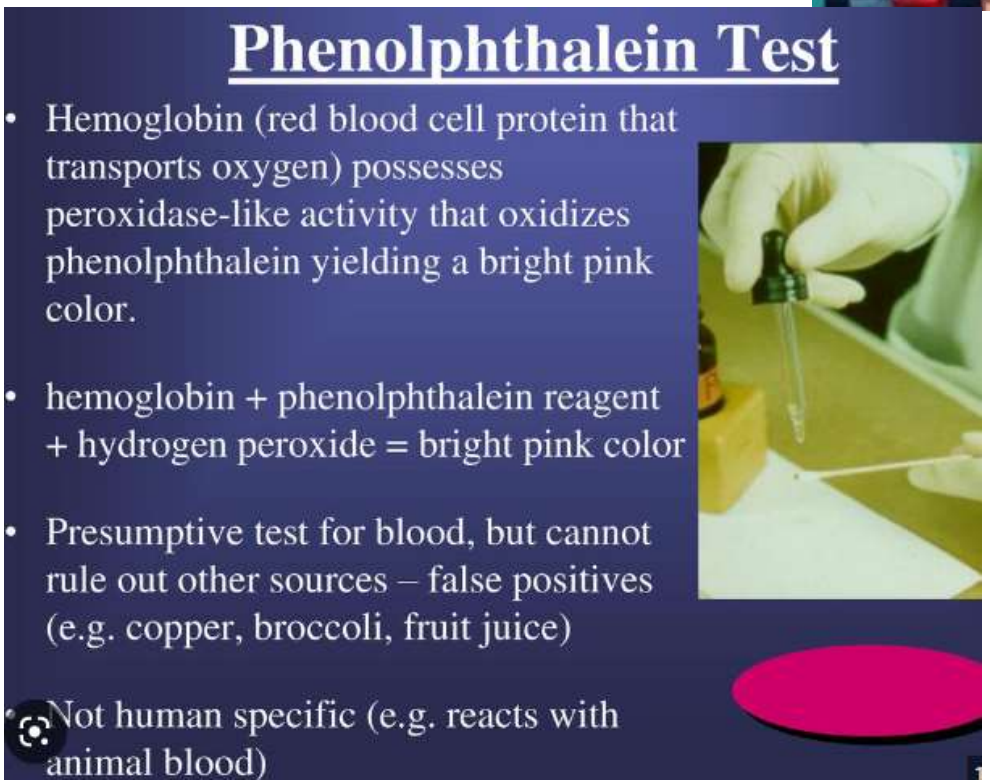
Fibrinogen is a complex glycoprotein present in high concentrations in plasma. Fibrinogen is converted to fibrin, which stabilizes blood clots and promotes hemostasis.

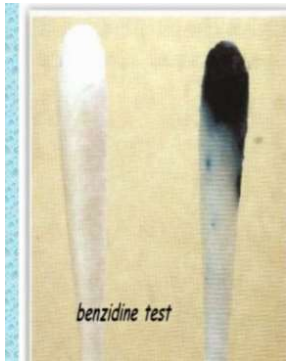
- Importance of blood analysis

1. For disputed parentage.
2. Determination of the direction of escape of the victim.
3. Determination of approximate time the crime was committed.
4. The preliminary tests used for the identification of collected fluid is blood or any other fluid?

BENZIDINE TEST – It gives blue color (positive).

PHENOLPTHALEIN TEST – It gives pink color(positive).



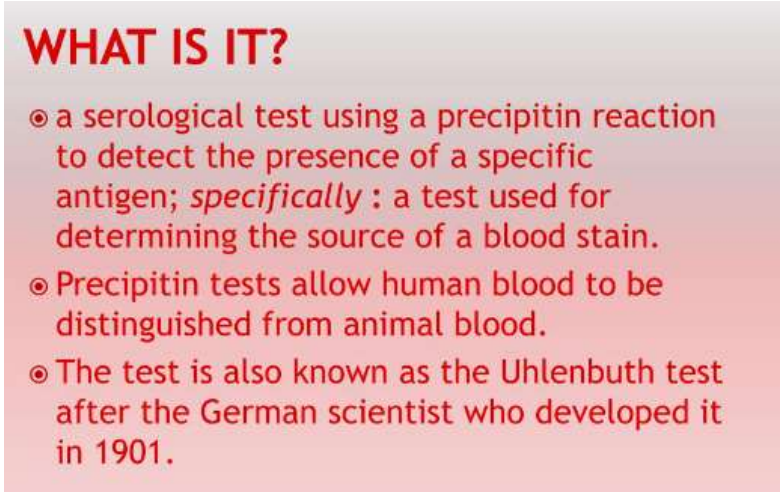


BLOOD ANALYSIS(Contd..

- **TAKAYAMA TEST** (Microscopic Confirmation test)

– Production of heamazoin crystals which are rhombic in shape & salmon pink color.

- **PRECIPTINE TEST** – It is mainly used to identify "whether the blood is belongs to human or animal?"



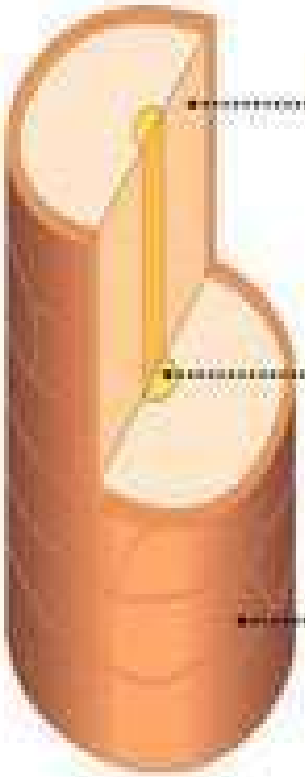
HAIR ANALYSIS

- **MICROSCOPIC EXAMINATION** – When determining whether the hair is belongs to human or animal , the laboratory investigator examines hair to…

  1. Ascertain its diameter

  2. Observe its medulla pattern

  3. Calculating medullary index



CORTEX

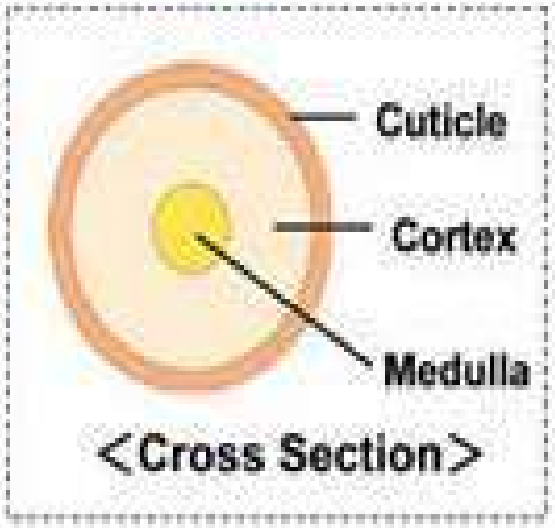
- Contains natural pigment (melanin) and moisture

MEDULLA

- Core of hair
- May even be absent

CUTICLE

- Outer layer of hair shaft (Over-lapping keratin cell)
- Works as protective scale
- Cuticle is transparent



HAIR ANALYSIS(Contd..)

- **MEDULLARY INDEX** – It is the important indicator to differentiate the human and animal hair.

- Human hair relatively has small medullary index, approximately 1/3 diameter of hair

CONCLUSION

- Chemists have made a number of important contributions to forensic sciences over past 2 centuries.

- When criminologist recognized the value of finger prints as reliable means of identifying individuals. They began to search for methods by which ,the sample could be collected &interpreted.

- Now a days the sophisticated instrumental methods have made a great contribution to forensic chemistry, gives the detailed information about the crime incident.