Fixative precipitate protein

A. Mercuric chloride

1. White crystals, soluble in water at room to about 7 % and alcohol to 33 %.
2. It is poisonous.
3. Precipitate protein , quickly penetrates and harden tissue.
4. It is shrinks but does not distort tissue.
5. Fix both nucleus and cytoplasm well.

B. Picric acid

1. Bright yellow crystals, soluble in water about 1% at room temperature and 5% alcohol.
2. Precipitate nucleoprotein.
3. Cause much shrinkage but little hardening.
4. Precipitate all proteins forming picrates.

C. Ethyl alcohol (Ethanol)

1. Colorless inflammable liquid.
2. Powerful dehydrating agent.
3. Cause shrinking and hardening.
4. Coagulates proteins but not nucleoproteins.
5. Miscible with water.
6. Reducing agent, easily oxidized.

Fixative not precipitate protein

A...Formaldehyde:

1) Is gas soluble in water to maximum 40%.
2) This solution tend to be acid (formic acid).
3) The concentrated solution of formalin some time become brittle on keeping through the production of paraformaldehyde.
4) Fix protein by forming additive compound without precipitation.

Additive compound: means protein substance instead of combining with them.

B...Potassium dichromate:

a) Orange crystals.
b) Tissue fixed with it should be washed with running tap water before proceeding to alcohol to prevent the forming of an insoluble precipitate.
c) Long time processing with it, make most tissue become brittle with difficulty in sectioning.

C...Acetic acid (glacial):

a) Colorless liquid of strong odor.
b) Swells collagen fibers.
c) Precipitate nucleoprotein.

Fixative

A-10% Formal saline :(colorless solution)

Preparation:

- 40%Formaldehyde……100ml
- Sodium chloride……8.5 gm
- Tap water…….. 900ml

Advantages:

1) Penetrates well, cause only little shrinkage.
2) Well preserver for blood and fat.

3) Not make the tissue brittle in long time treatment.
4) In fixing a large specimen, its color is preserved better than other fixatives.
5) It permits a large variety of staining.

Disadvantages:

Long time for specimens stored in formal saline for many months, formic acid is produced, which destroys the staining properties of the tissues

B-10%Formalin:

Preparation:

- 40%Formaldehyde …… 100ml
- Tap water…….. 900ml

Advantages:

1) Produce very little shrinkage.
2) Large specimens preserved for long time and change every 3 months.
3) Fixation with it can be followed by most staining technique.

Disadvantages

1) Has an irritant vapor ,which may affect the nasal mucosa and cause sinusitis.
2) Produce dermatitis by prolonged contact with the skin.

C-Zenker fixative:(orange solution)

Preparation:-

- Mercuric chloride ……...5 gm
- Potassium dichromate……2.5 gm
- Sodium sulphate……1 gm
- Distilled water……....100 ml

Advantages

1) Permits excellent staining of nuclei and connective tissue fibers.
2) It's good for animal tissues.

Disadvantages

1) Penetration is poor.
2) Tissue thickness should not exceed 0.5 cm
3) Tissues immersed in it more than 24 hr become brittle.
4) Need washing in running tap water for several hours after fixation.
5) Bad cutting of frozen tissue fixed with zenker.
6) Zenker solution cannot keep well after addition of glacial acetic acid.
7) Mercury precipitate like course black pigment.

D-Bouins fixative:(yellow solution)

Preparation:

Saturated aqueous picric acid…….75ml

40% Formaldehyde……..25ml

Glacial acetic acid…….5ml

Advantages:

1) Penetrates rapidly .
2) Permits very good staining of nuclei and connective tissue fibers.
3) Good for animal tissues.
4) Not need washing with tap water after fixation, transfer directly to 70% alcohol.

Disadvantages:

1) Cause brittleness for some tissues.
2) If tissue left in fixative 24hrs causing difficulty in cutting.
3) Kidney should never be preserved in it.

E-Carnoy's fluid:

Preparation:

- Absolute alcohol……..…60ml
- Chloroform…….30ml
- Glacial acetic acid……..10ml

Advantages:

1) Penetrating and quick acting fixative.
2) Fixed thin sections of tissue in 1-3hrs.
3) Not need washing with tap water and transfer directly in to absolute alcohol.
4) Good for animal tissues.

Disadvantages:

1) It is suitable only for small piece of tissue.2) Recommended for glycogen.