

Dental x-ray film is a recording media on which image of the object was made by exposing this film to x-ray.

We have 2 types of x-ray films:-

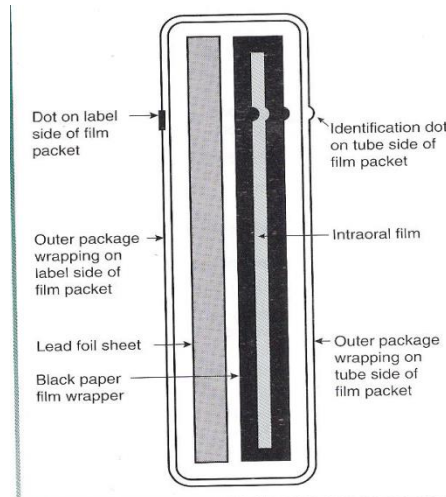
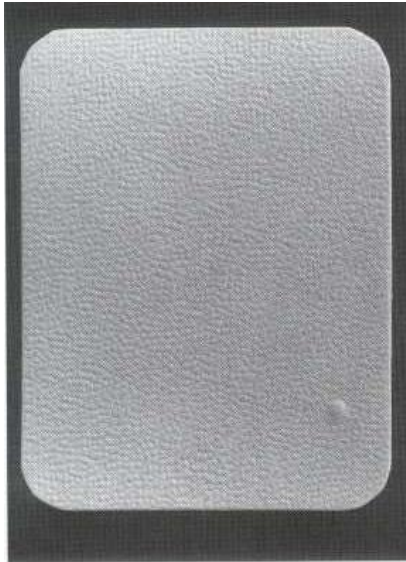
1-Intraoral x-ray films.

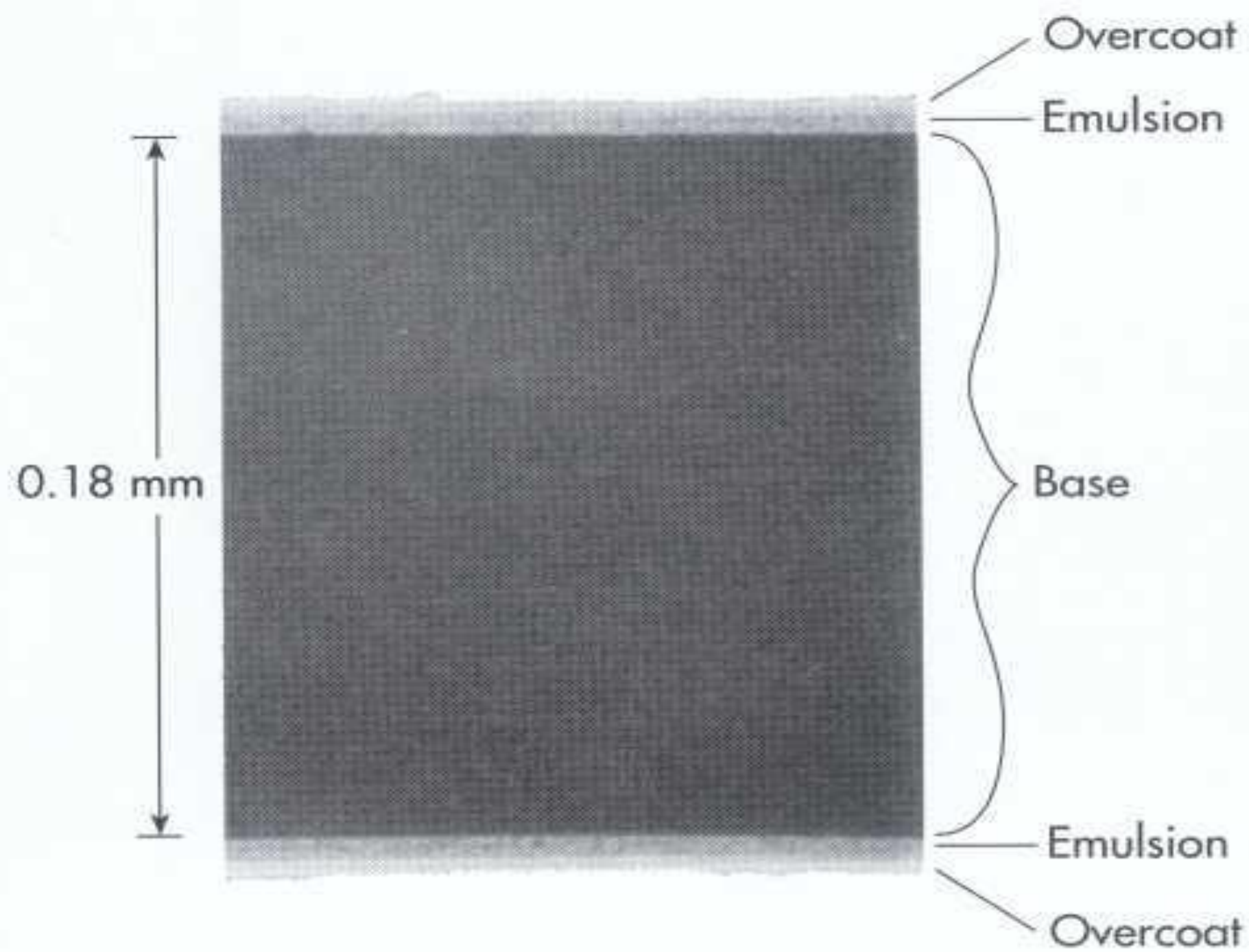
2-Extraoral x-ray films.

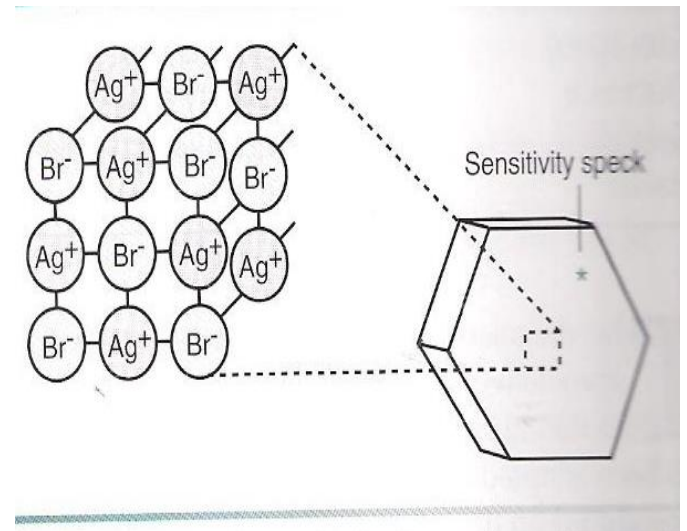
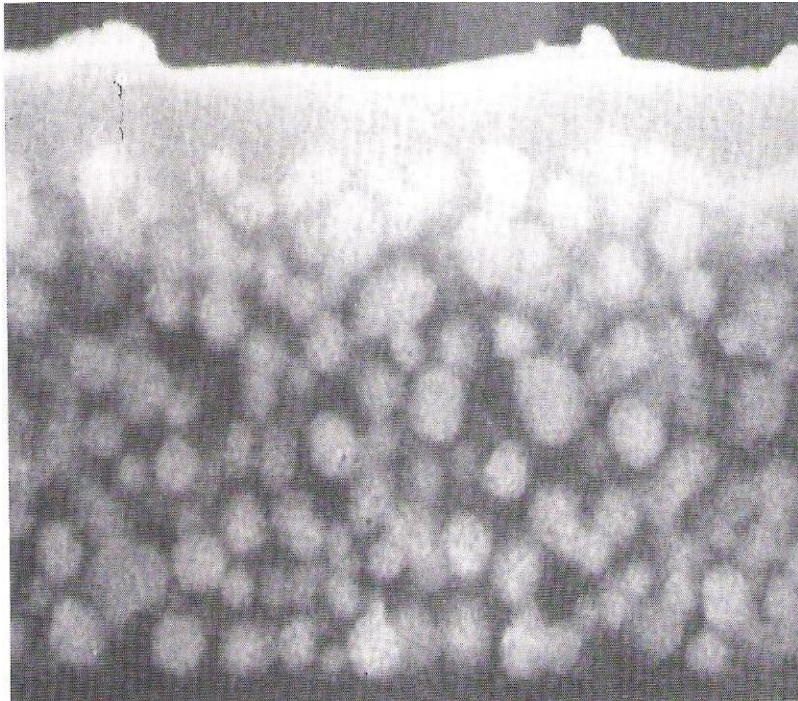
INTRA ORAL X-RAY FILM CONSTRUCTION:-

x-ray film consists of a sensitized emulsion present on both sides of transparent base.

The base is made of cellulose acetate and the emulsion consists of silver halides (mostly silver bromides suspended in gelatin).







and this surface is the one that faces the source of radiation during exposure.

Intra oral films are wrapped in an opaque material to prevent light because light photons also activate silver halide crystals. This wrapping is water proof to prevent the patient saliva from reaching the film.

A thin sheet of lead foil is usually placed within the film packet behind the film; this foil prevents most of secondary radiation that originated in the tissue of the patient behind the film packet from reaching the film so this foil helps to:-

- 1- Reduce secondary radiation film fog; this foil absorbs X-rays that have passed through the object and the film.
- 2- So it reduces the exposure of the tissue behind the film.
- 3- The lead foil has design of herring bone pattern and this design appear on the exposed film if the X-ray film was facing the wrong way during exposure.

Dot on label
side of film
packet

Identification dot
on tube side of
film packet

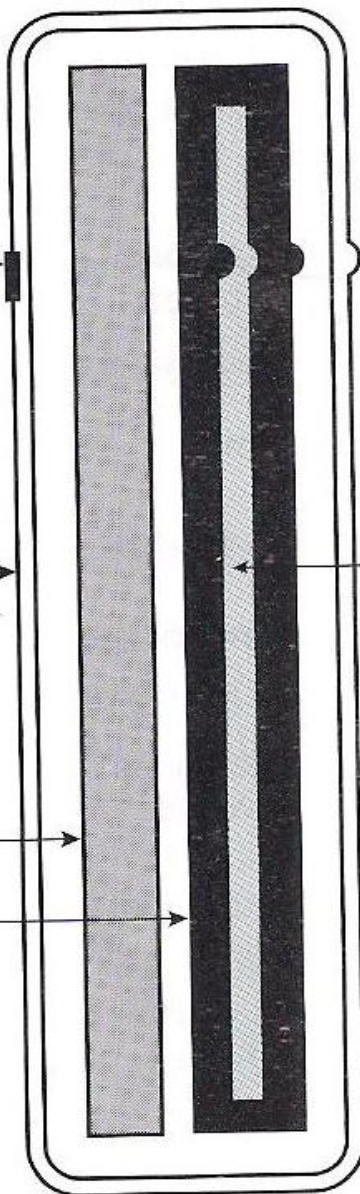
Outer package
wrapping on
label side of
film packet

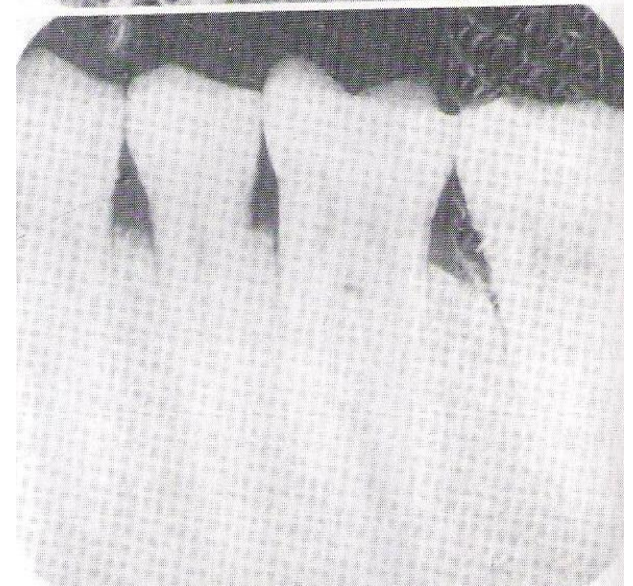
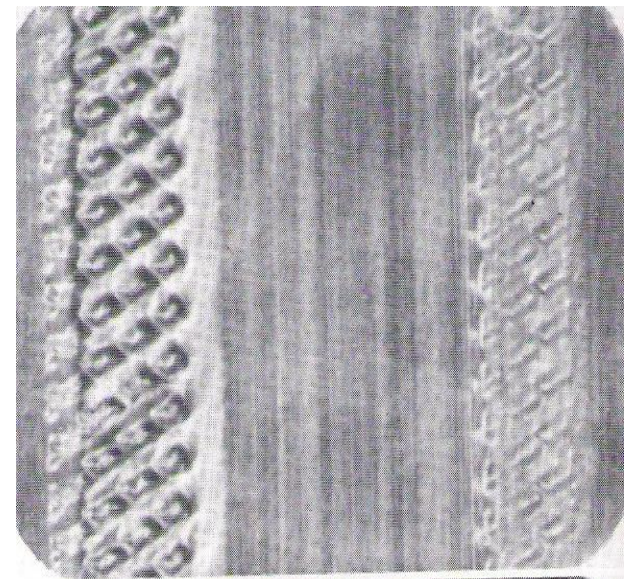
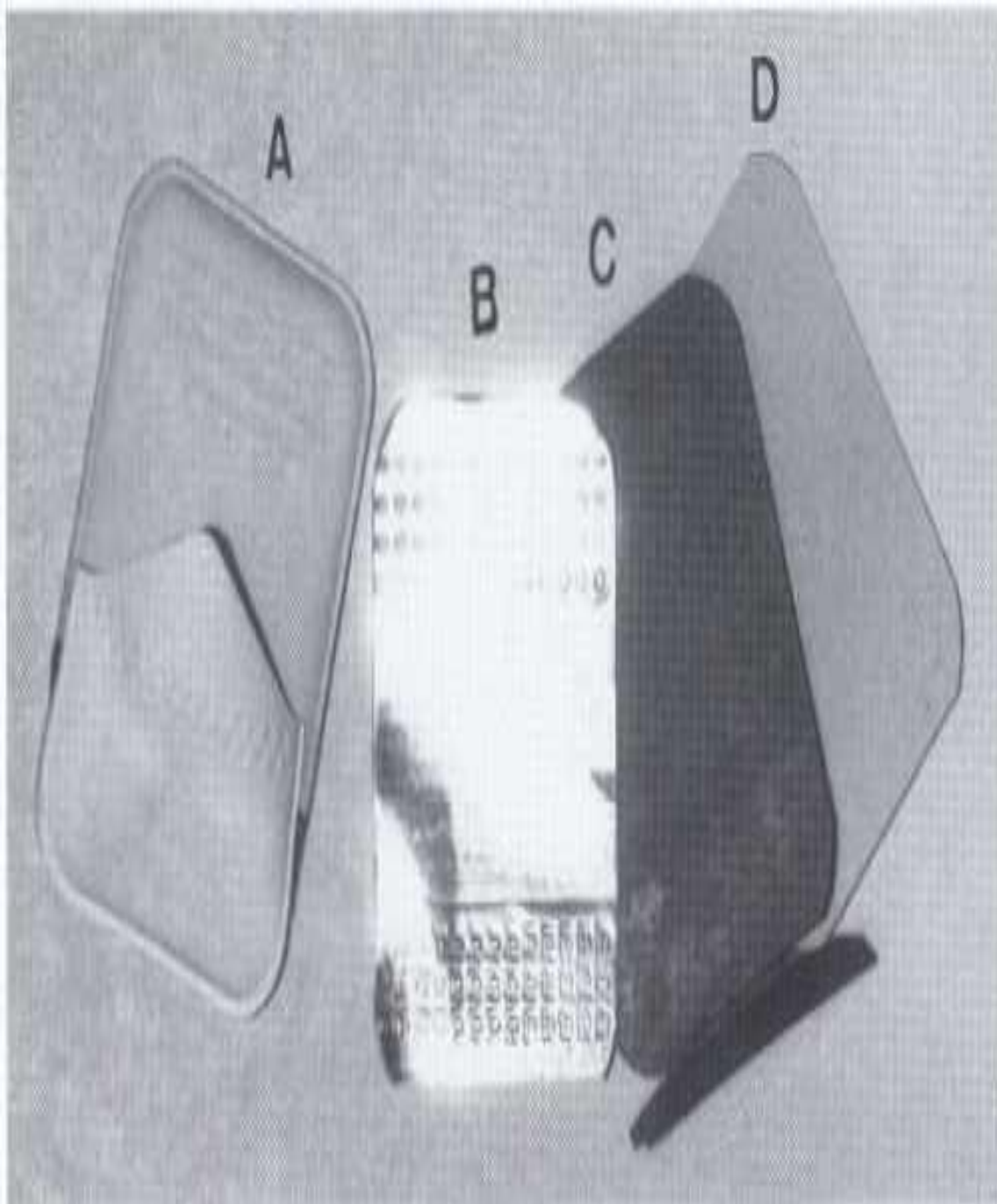
Intraoral film

Lead foil sheet

Outer package
wrapping on
tube side of
film packet

Black paper
film wrapper





Film types and size

Types of intraoral x-ray films:- •

1-Type 1 :-periapical film .Present in different sizes •
from (1.00, 1.0, 1.1 and 1.2).

2-Type 2:- bitewing film . Present in different sizes •
from (2.00, 2.0, 2.1, 2.2 and 2.3).

3-Type 3:-occlusal film .One size (3.4). •

The sizes and types of intraoral films have been •
standardized on numerical basis.

Intraoral film speed:-standardized on alphabetical •
basis (range from A to F) film speed (A) slower
while(F) is faster one.

Periapical

Size 2
 $1\frac{1}{4} \times 1\frac{1}{8}"$
31 x 41 mm

Anterior Posterior
Adult ■ Child 9 to 12 yrs

Size 1
 $1\frac{1}{8} \times 1\frac{1}{8}"$
24 x 40 mm

Anterior Adult
Child 6 to 8 yrs
Posterior
Child 6 to 8 yrs

Size 0
 $\frac{7}{8} \times 1\frac{1}{8}"$
22 x 35 mm

Anterior Posterior
Child 3 to 5 yrs

Bite-wing

Size 3
 $1\frac{1}{8} \times 2\frac{1}{8}"$
27 x 54 mm

Posterior
Adult

Size 2
 $1\frac{1}{4} \times 1\frac{1}{8}"$
31 x 41 mm

Posterior
Adult

Size 1
 $1\frac{1}{8} \times 1\frac{1}{8}"$
24 x 40 mm

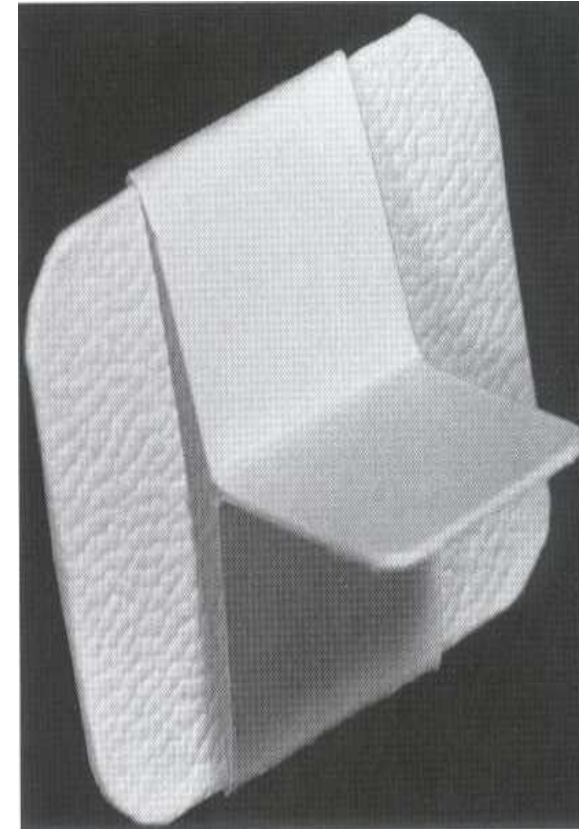
Anterior
Adult ■ Child

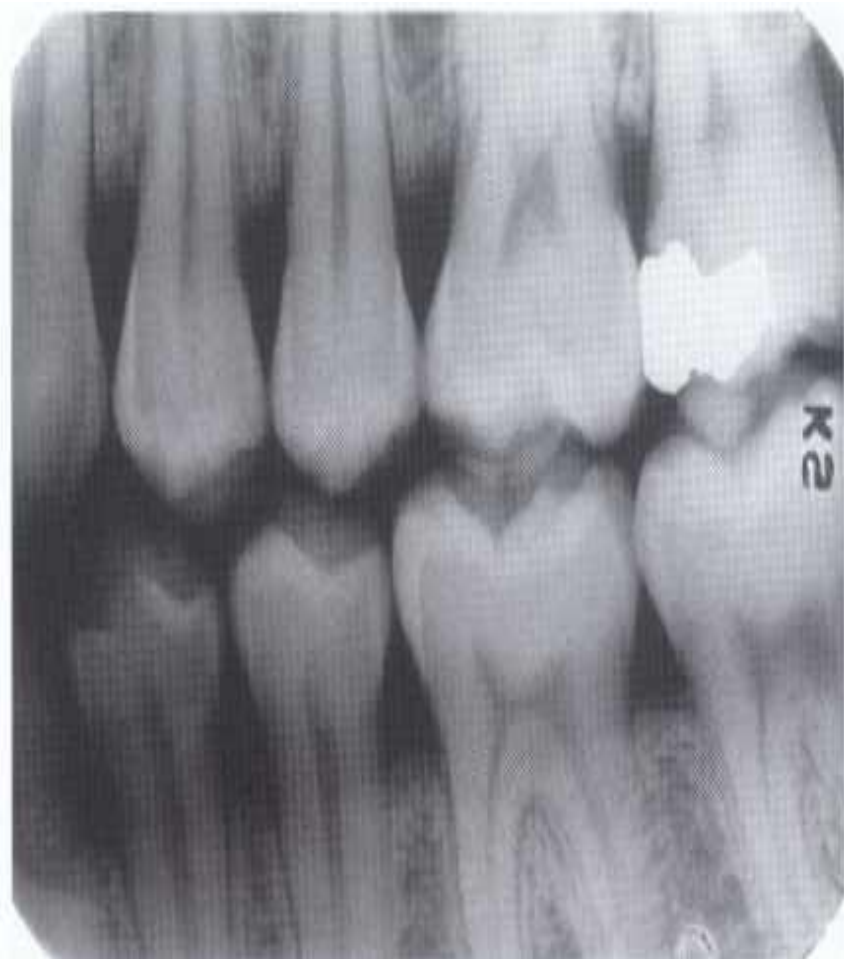
Size 0
 $\frac{7}{8} \times 1\frac{1}{8}"$
22 x 35 mm

Posterior
Child

Occlusal

Size 4
 $2\frac{1}{4} \times 3"$
57 x 76 mm

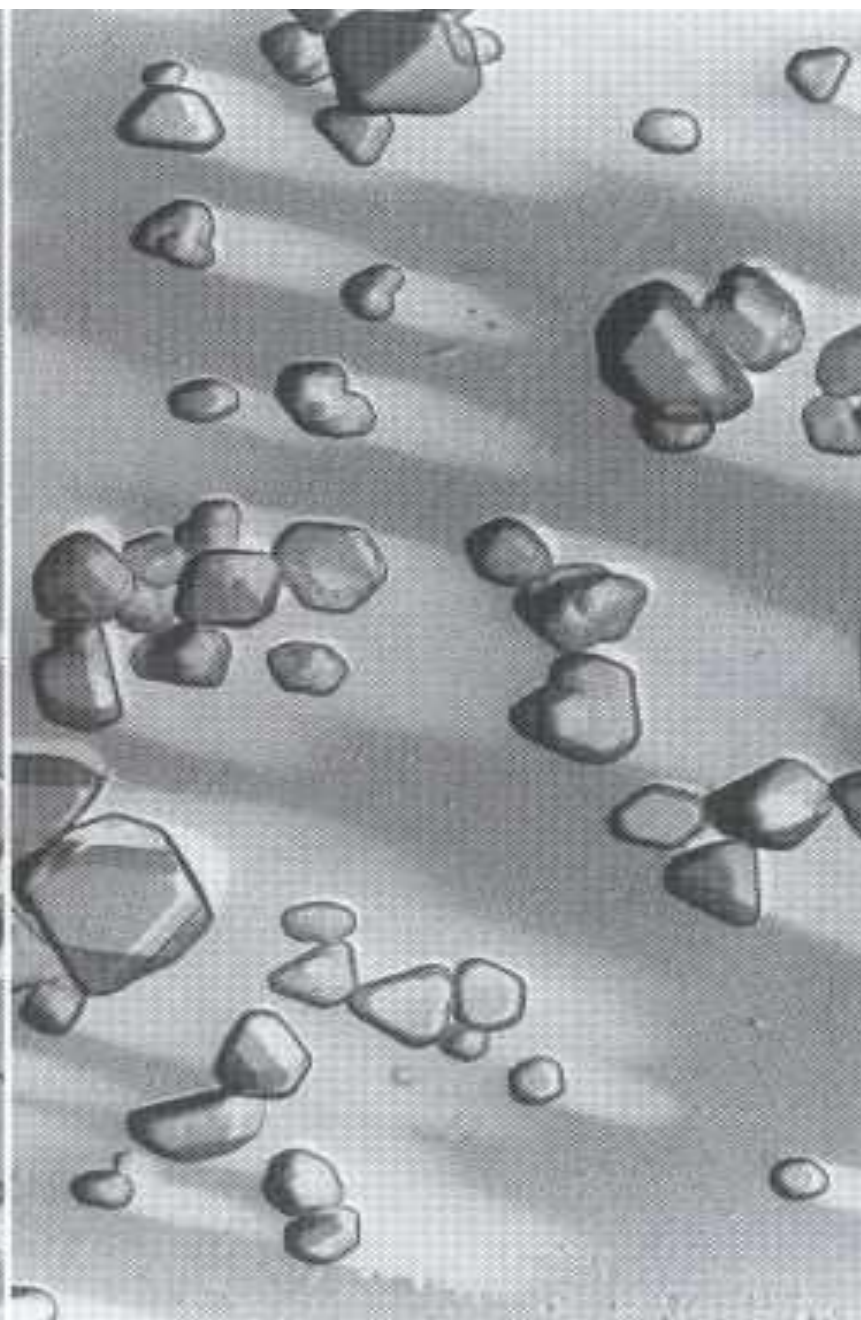
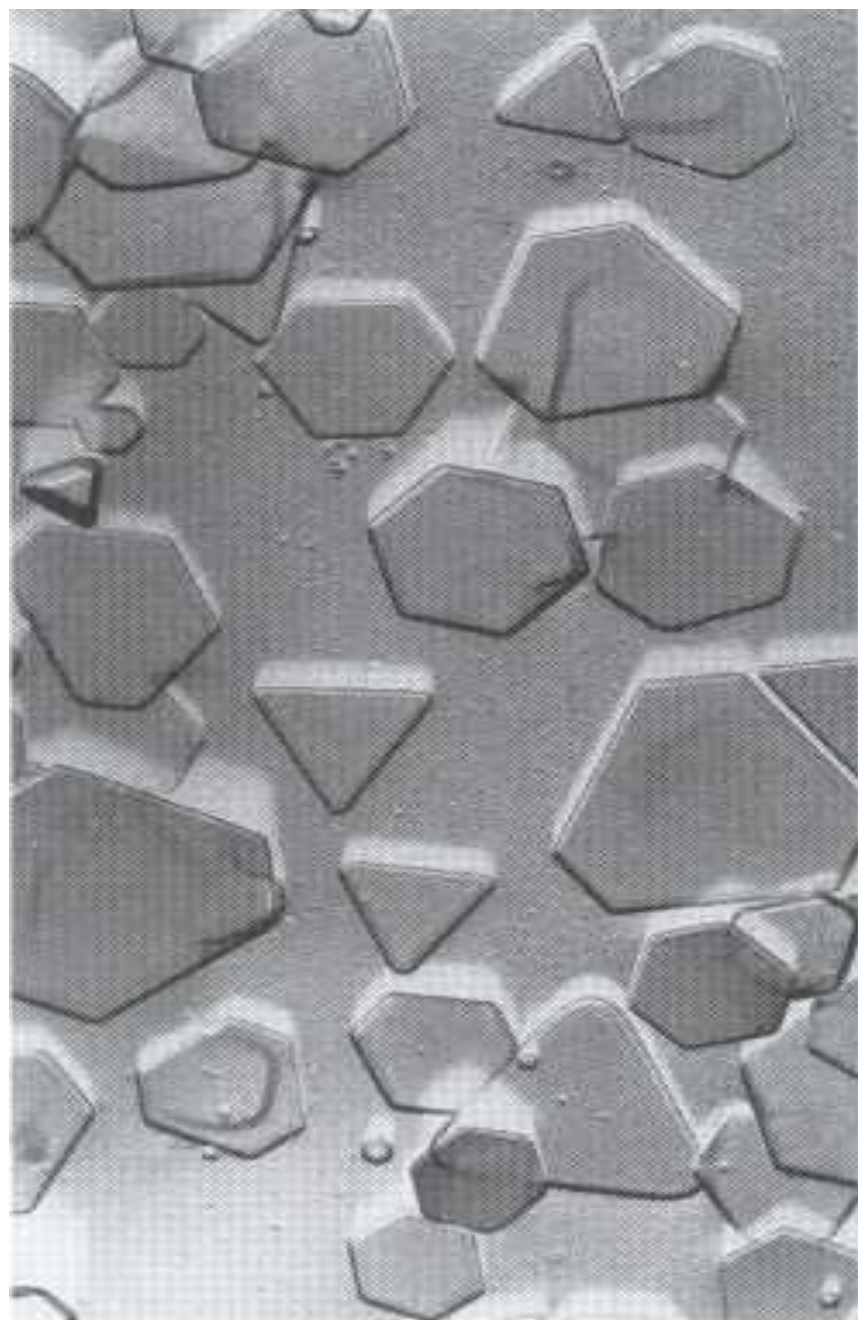


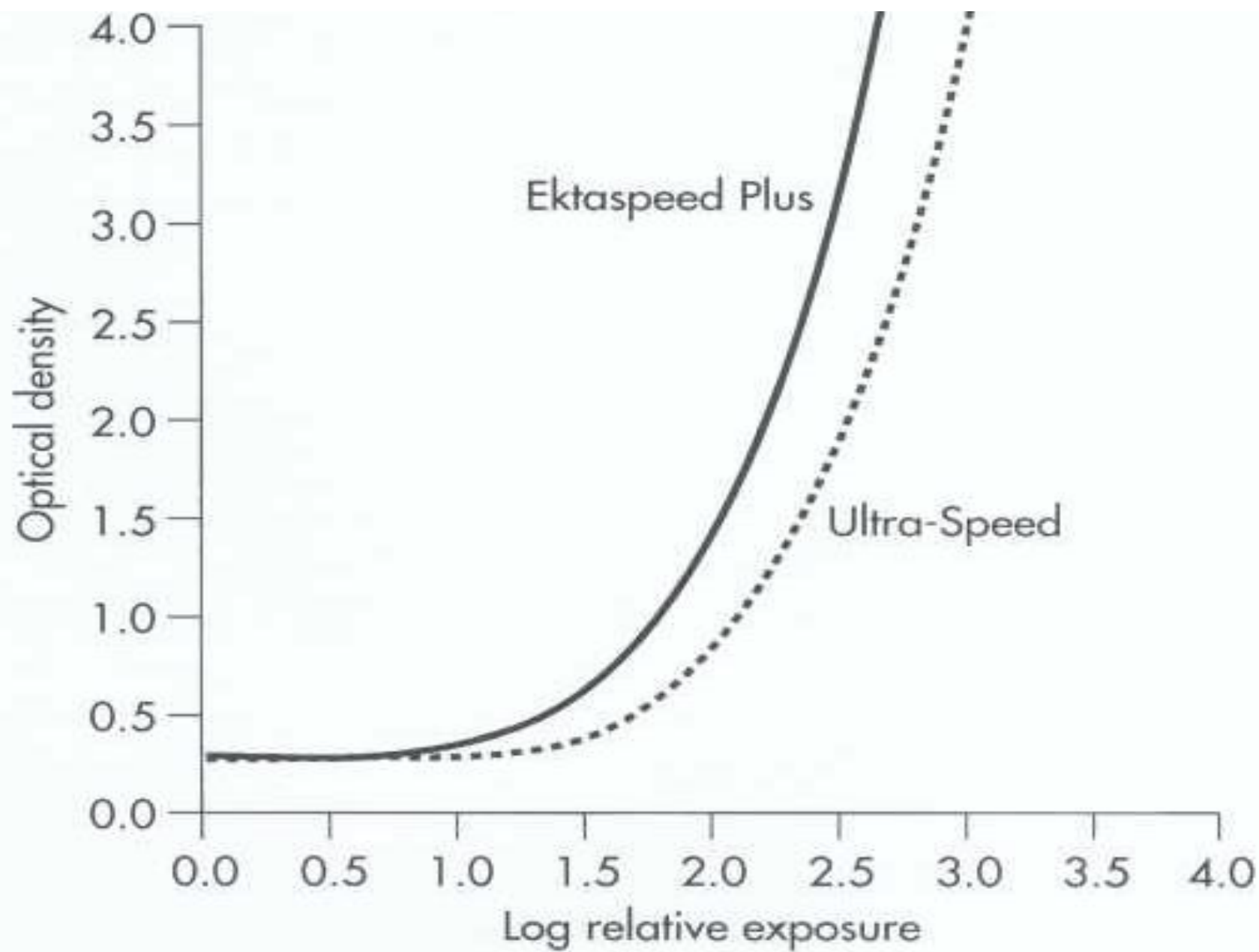




Intra oral film speed:-

It means the sensitivity of the x-ray film to x-radiation depends on the size of silver halide crystals (film grain), so the larger the grain size the faster the film speed. Intra oral film speeds have been standardized on alphabetical basis. So film speeds will range from (A) to (F), film speed (A) is slower while film speed (F) is faster one. On H and D curve the faster film is on left side because it needs less exposure time. In general the faster film speed the much less amount of X-radiation required to produce the photographic image and this means a reduction in patient exposure.





The extraoral film:-Extraoral film is used for radiographs of the jaws, facial bones, the temporomandibular joints, and other relatively large areas. This film has no embossed dot to identify right and left.

we have two types:

1- Non screen film:- •

2- Screen film:-Intensifying screens are used with extraoral film to intensify the effects of the exposing rays and lessen the exposure time. •

A cassette is constructed of rigid metal, plastic, or cardboard. It often contains intensifying screens, thus reducing exposure time. The film must be transferred to the cassette from its paper covering in the protection of the dark room. •

The purpose of a cassette is to hold •

each intensifying screen in contact with the x-ray film to •

maximize the sharpness of the image •

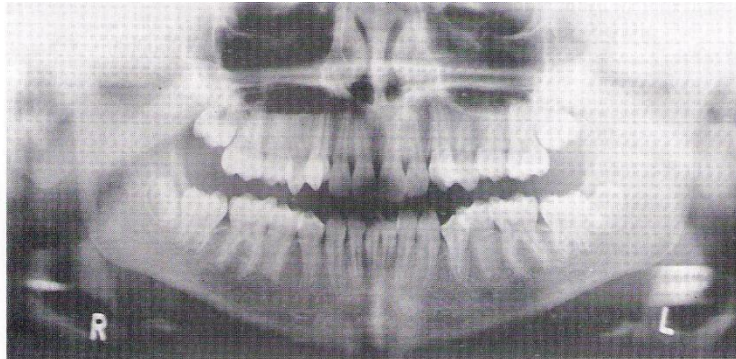
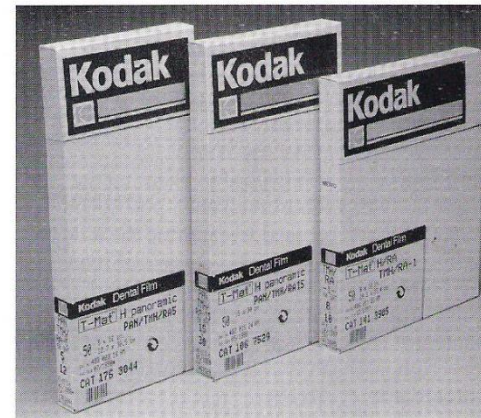
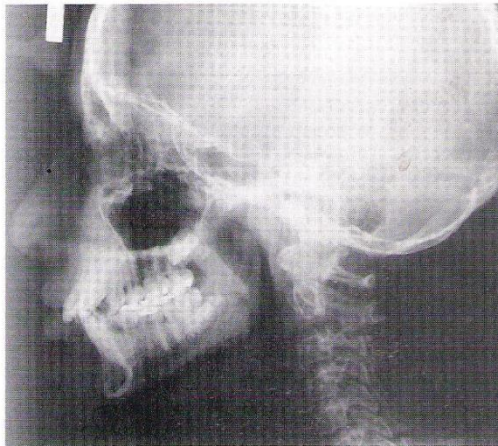


FIGURE 7-15 A panoramic film. (Courtesy Eastman Kodak Company, Rochester, NY.)



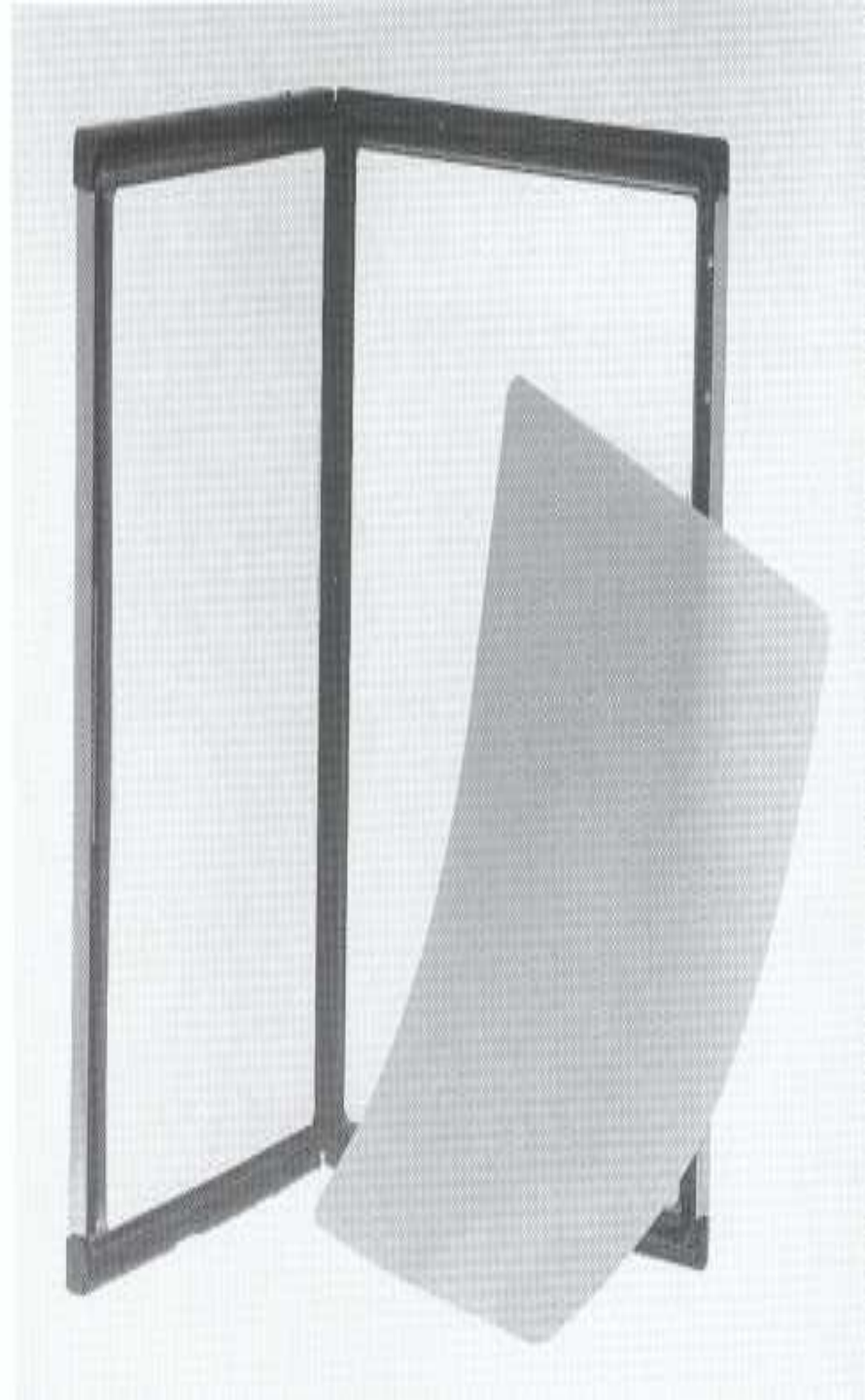
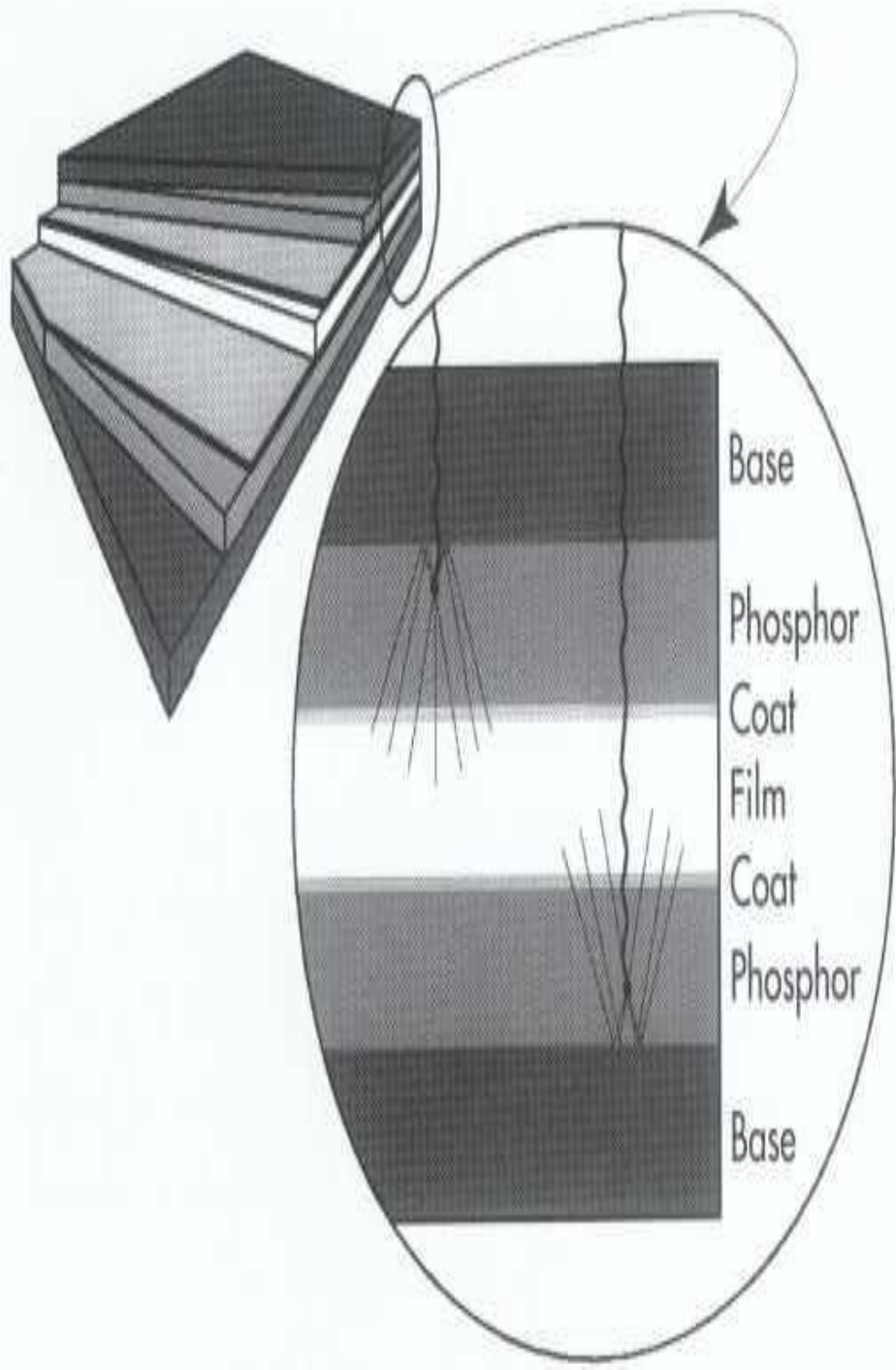
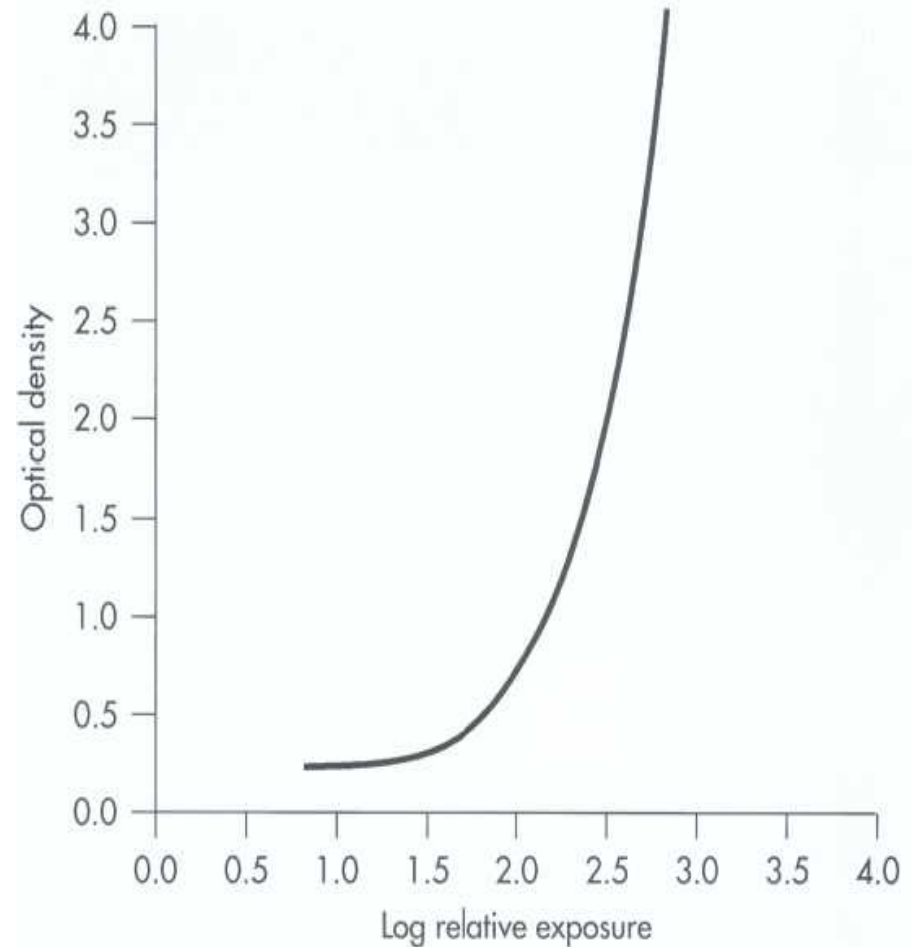


Image Characteristics

1-RADIOGRAPHIC

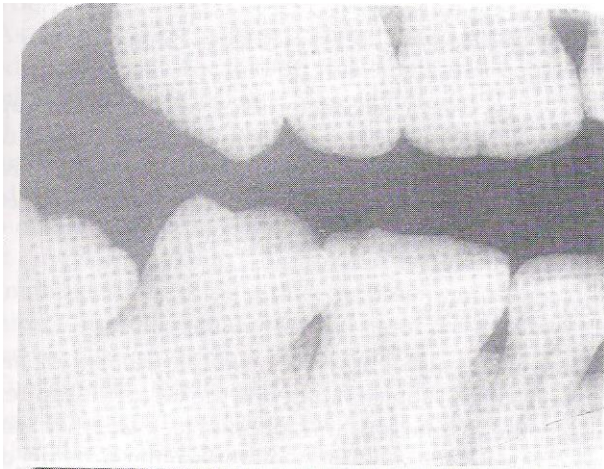
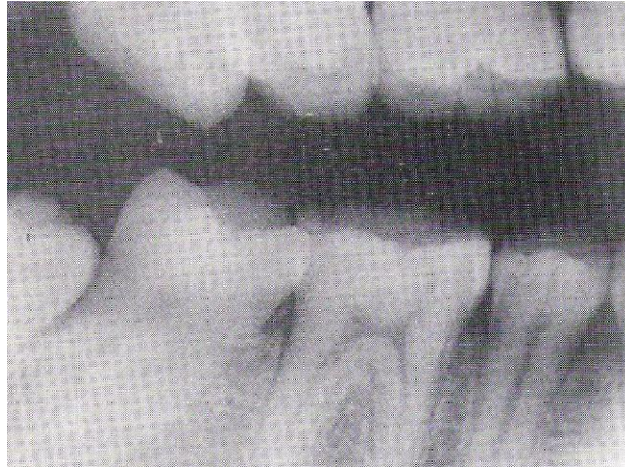
DENSITY: The overall degree of darkening of an exposed film.

- Log scale = $\log 10 = 1$
- DX DENSITY(0.5-2.5)



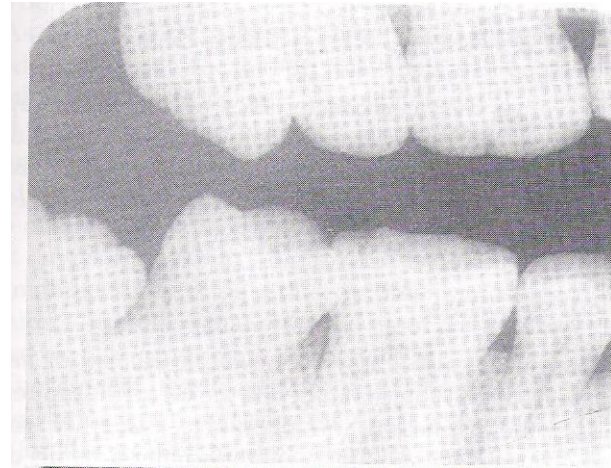
factors

1. Exposure time
2. Milliamper
3. Kv
4. Developing time
5. distance between film and film lead to decrease of density.

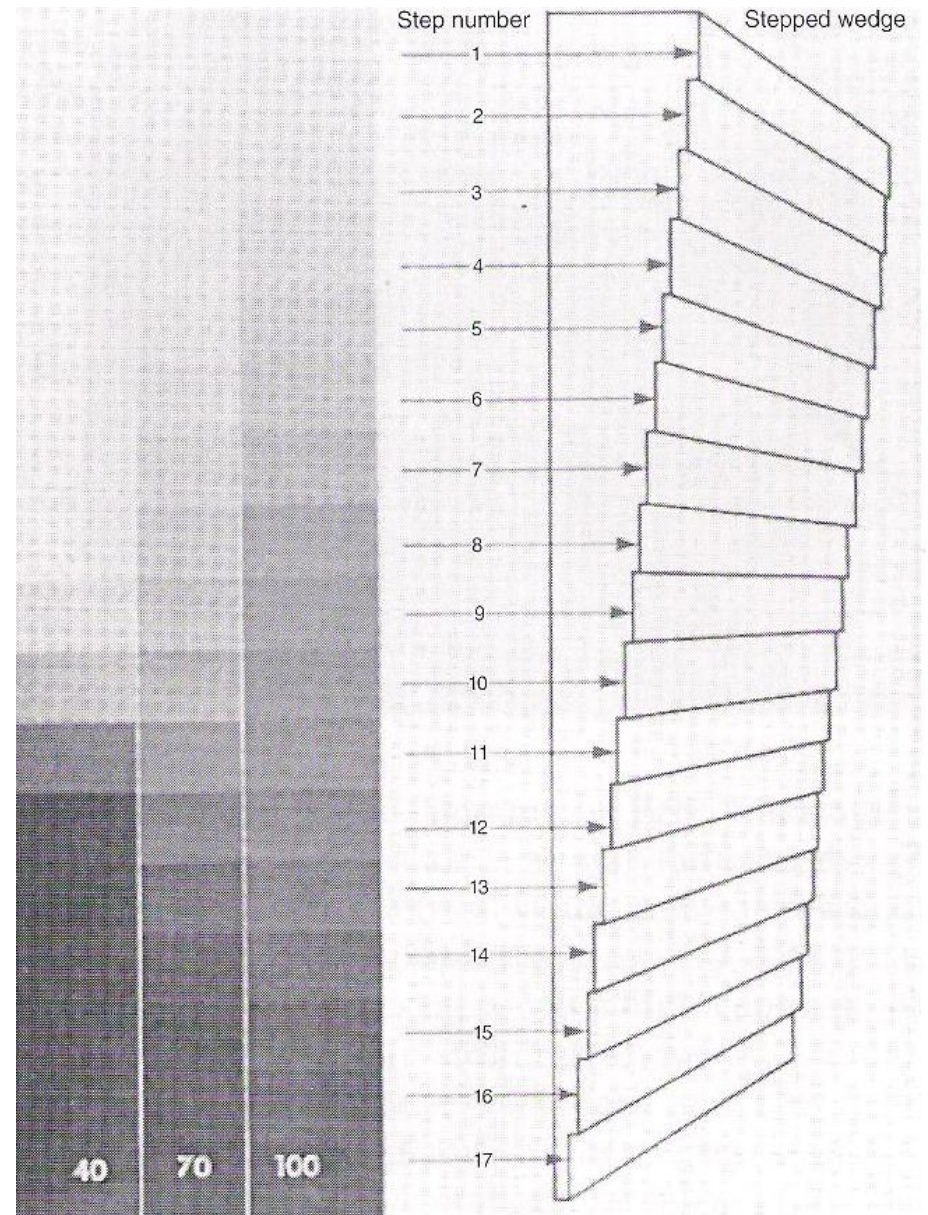
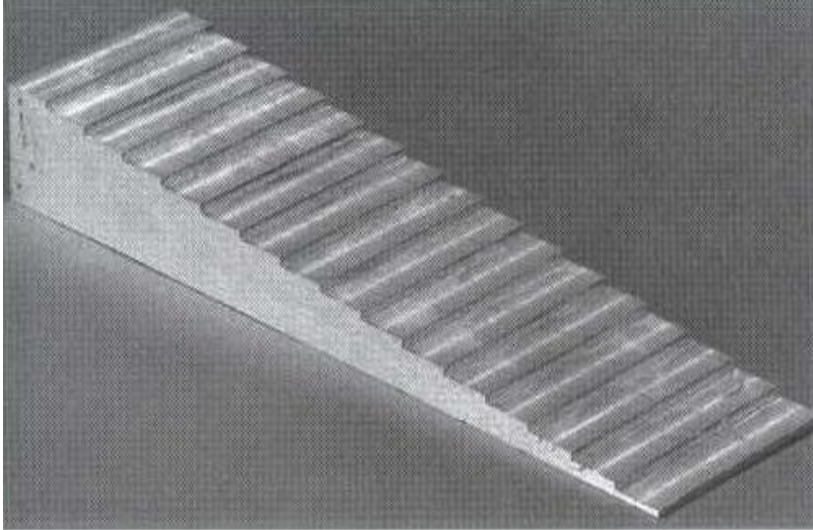


2-RADIOGRAPHIC CONTRAST

the range of densities on a radiograph. It is defined as the difference in densities between light and dark regions on a radiograph.



AL STEP WEDGE

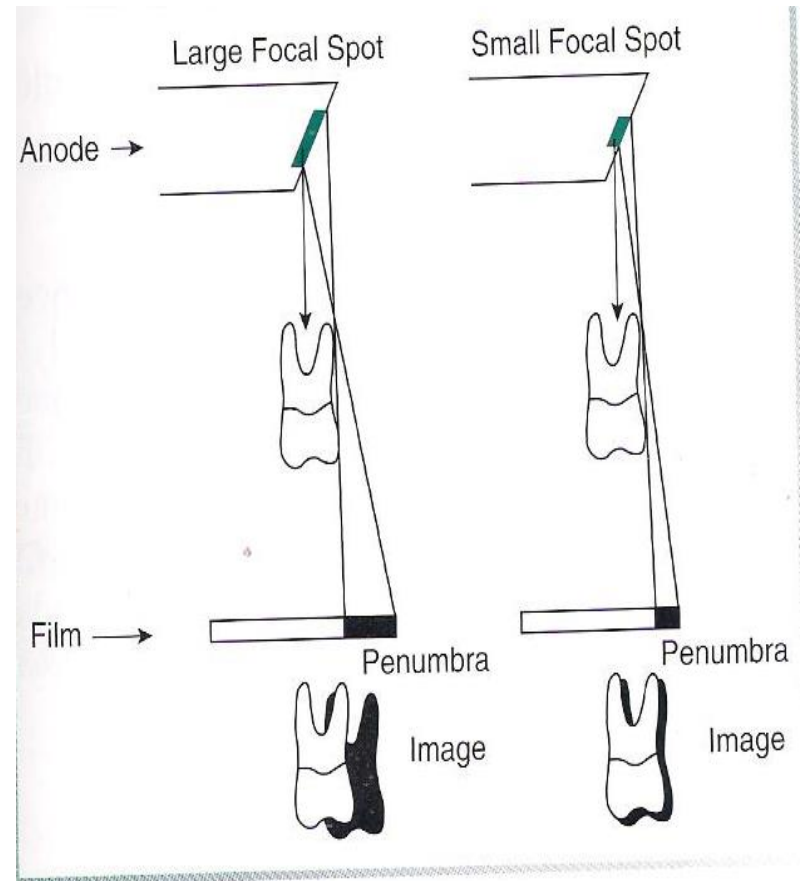
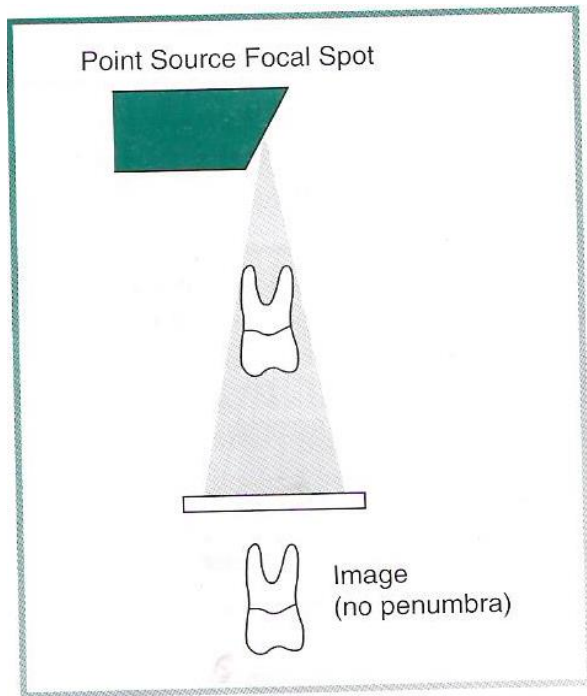


factors

1. Kv
2. Processing temperature
3. Inherent

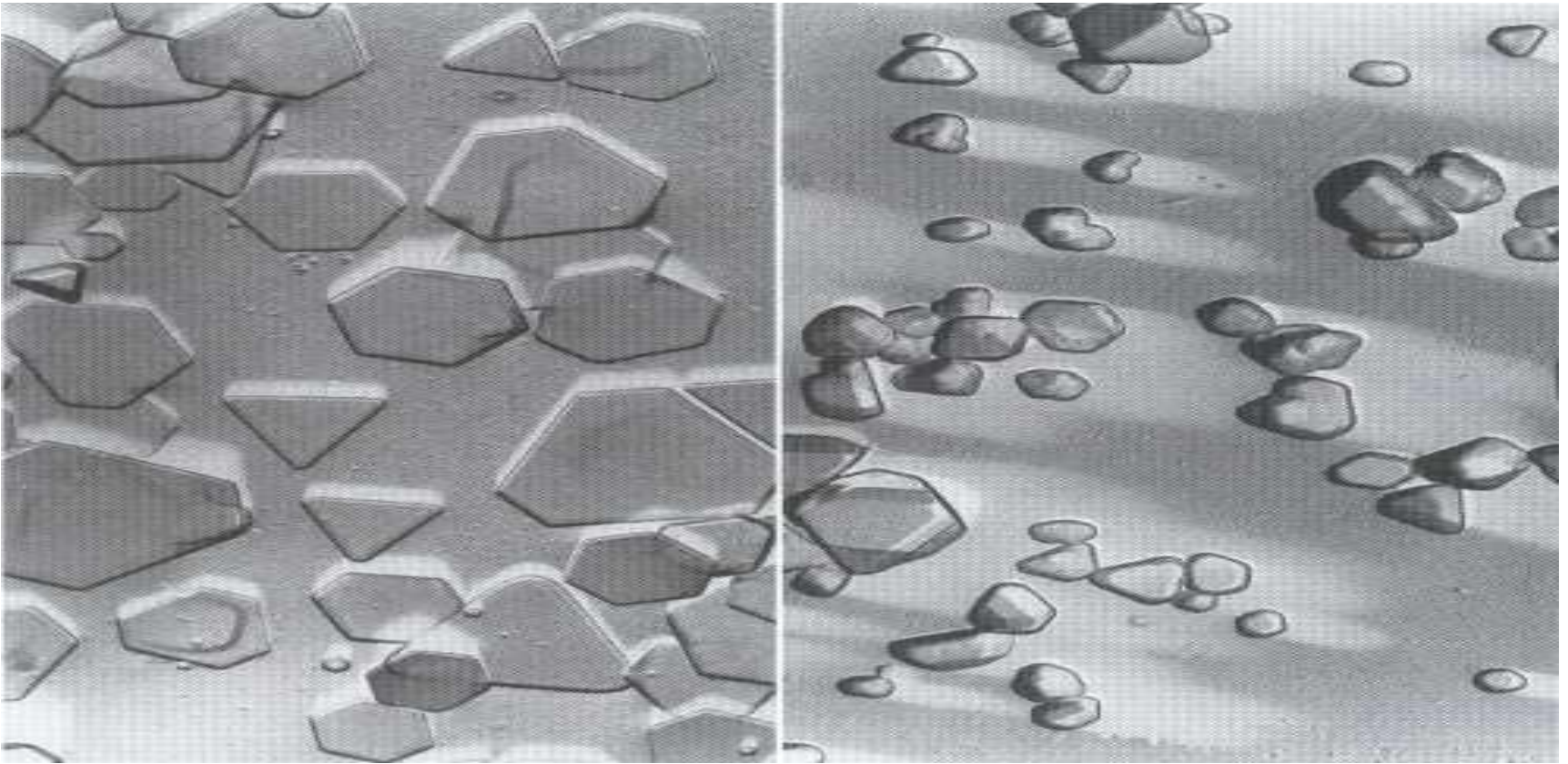
3-Details factors

1-Focal spot size.small •

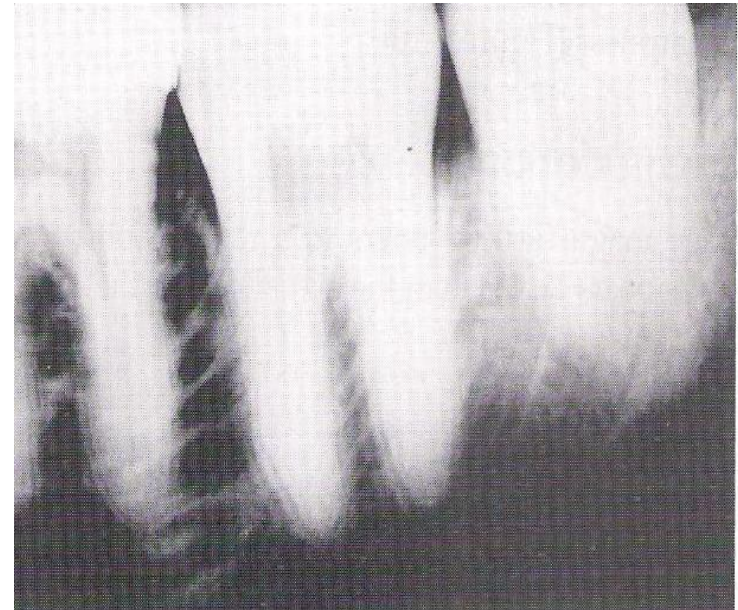
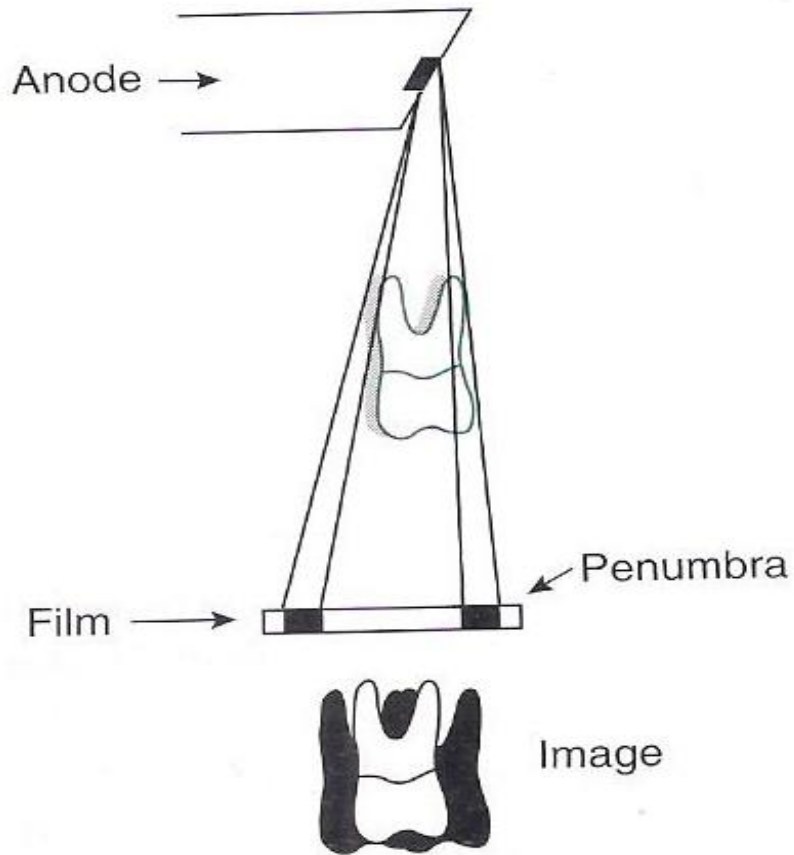


2-film grain size

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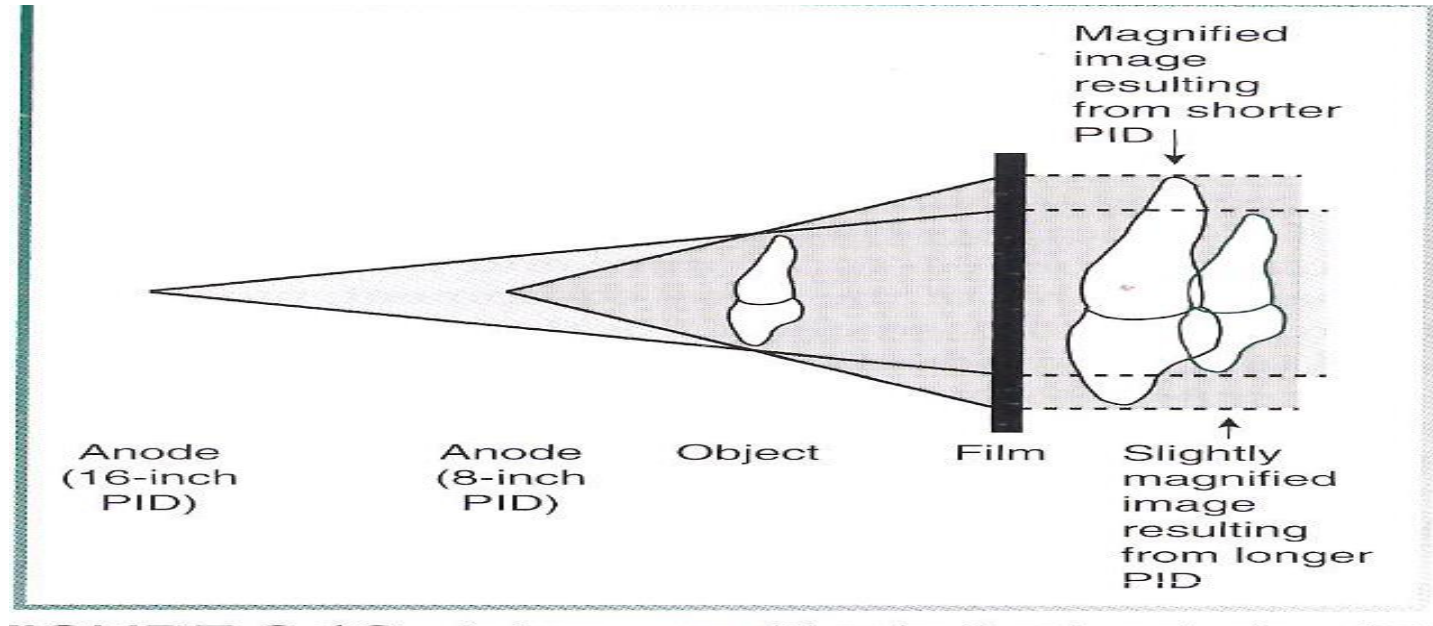


3-Movement (pt,tube,film)

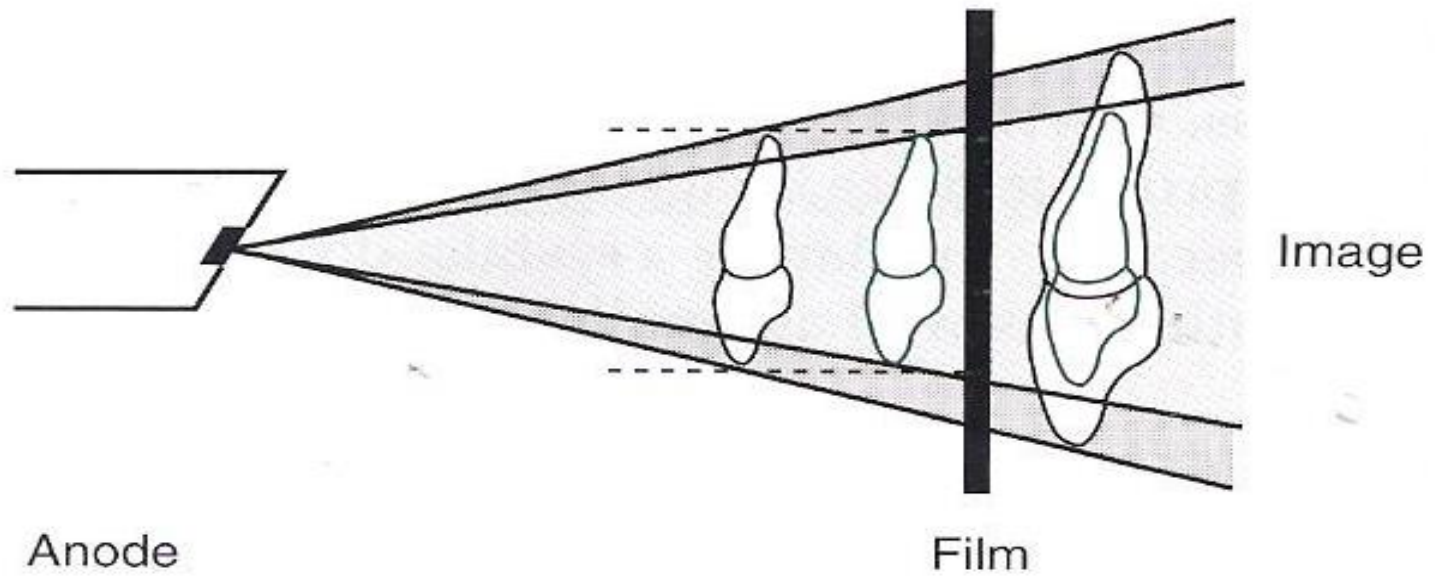


4-S.F.D

•



5-O.F.D

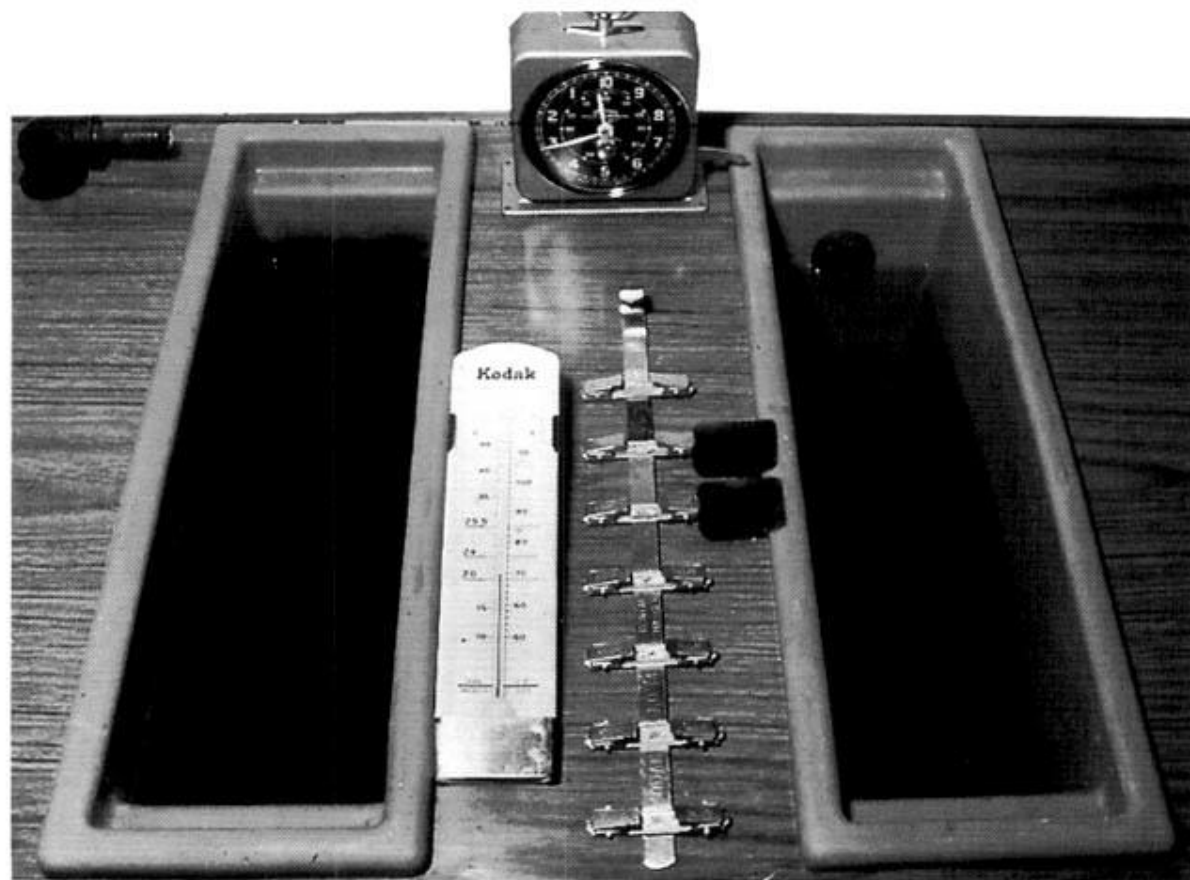


Processing X-Ray Film

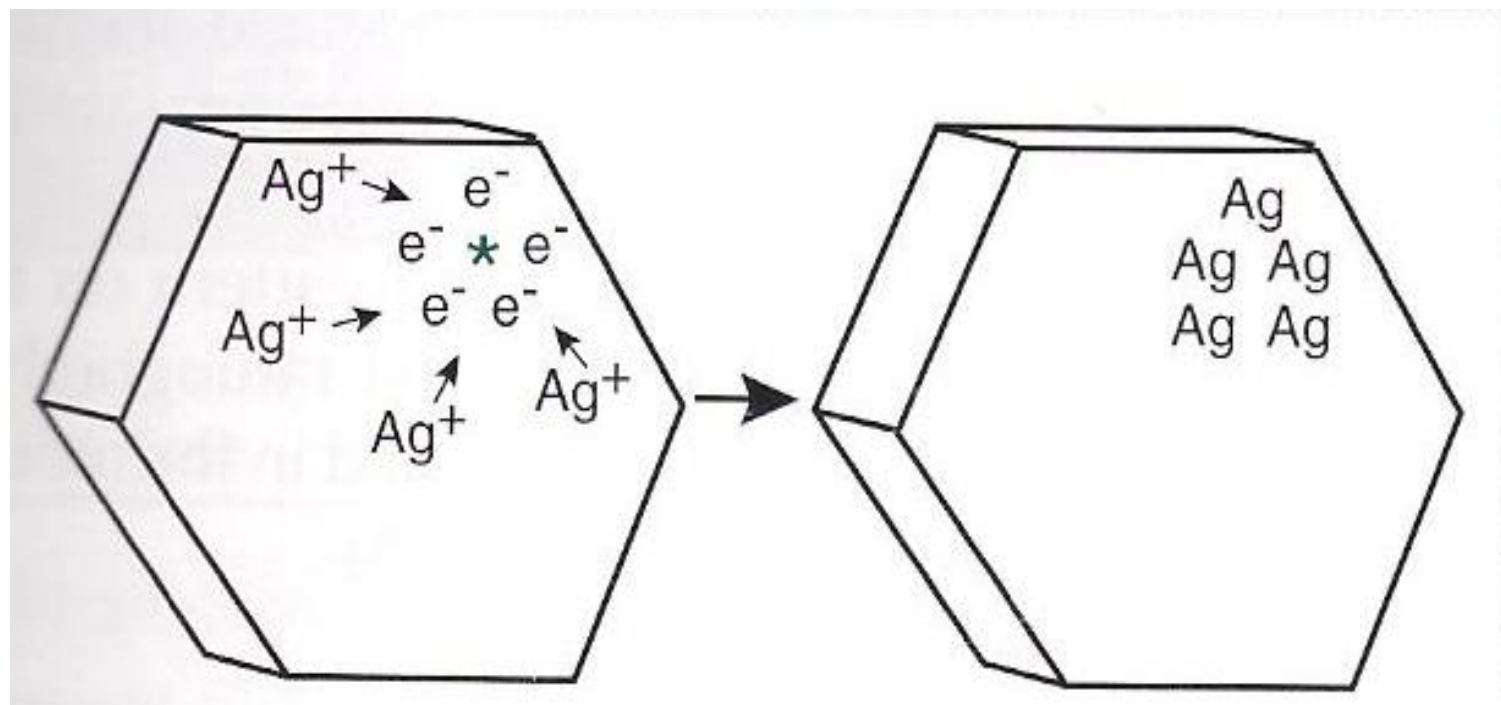
CYLCLE;

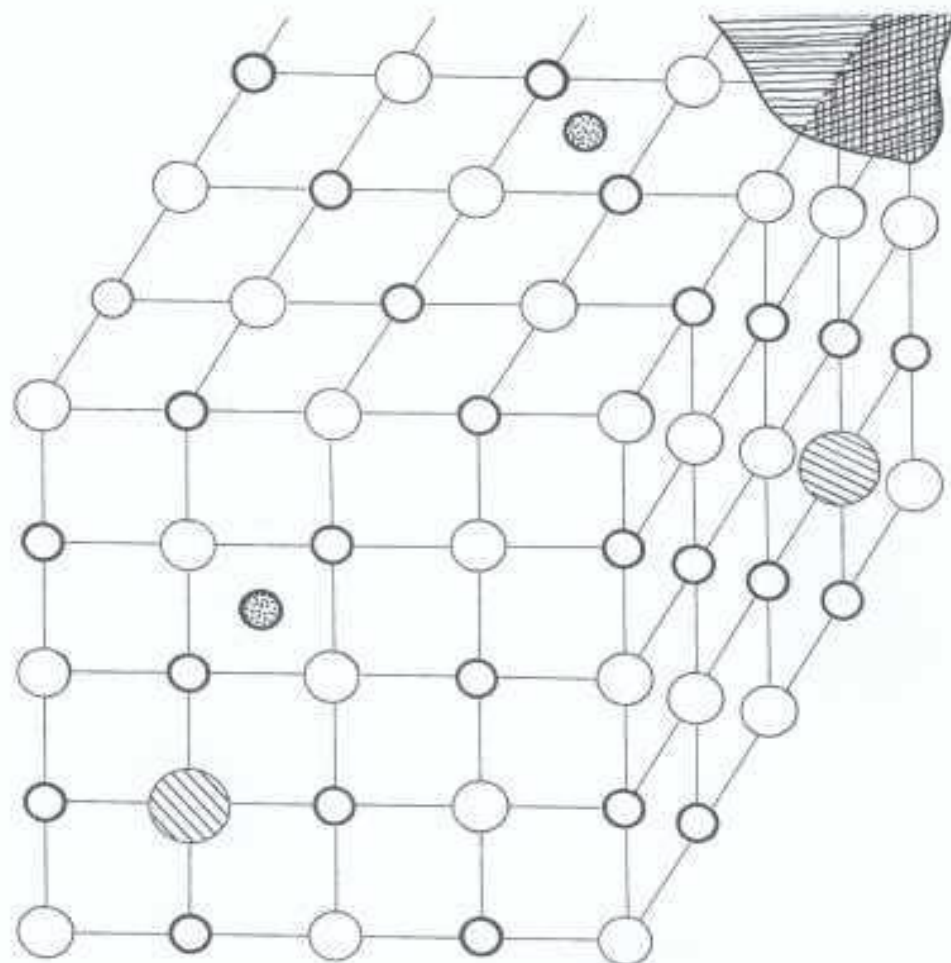
DEVELOOPIING,RINISING,FIXING

WASHING



latent image





Iodide ion



Bromide ion



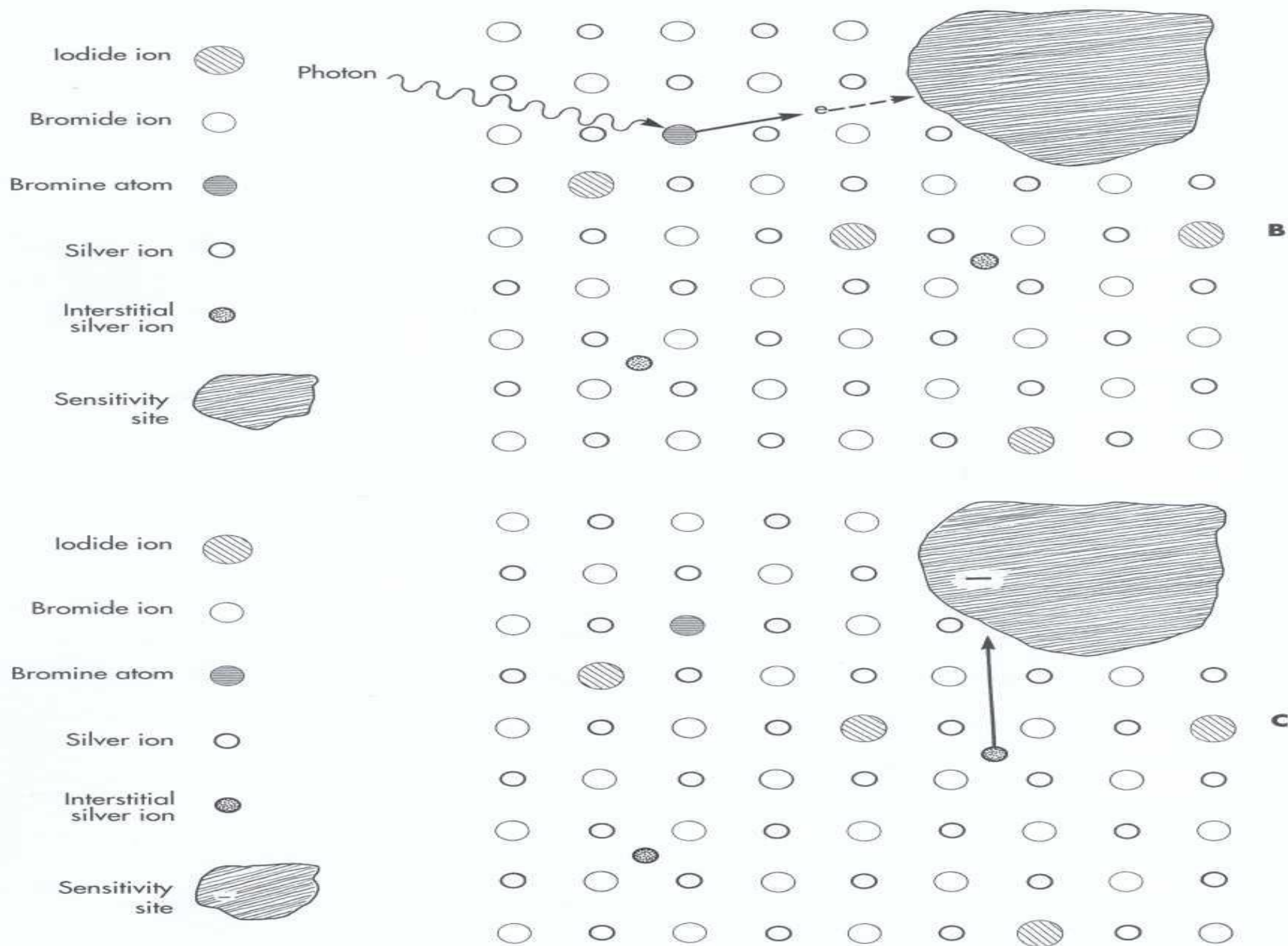
Silver ion



Interstitial silver ion



Sensitivity site



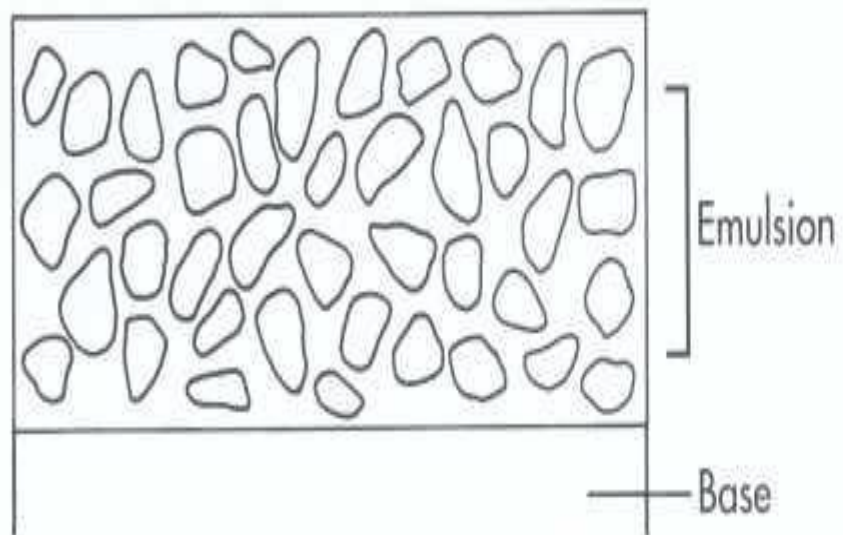
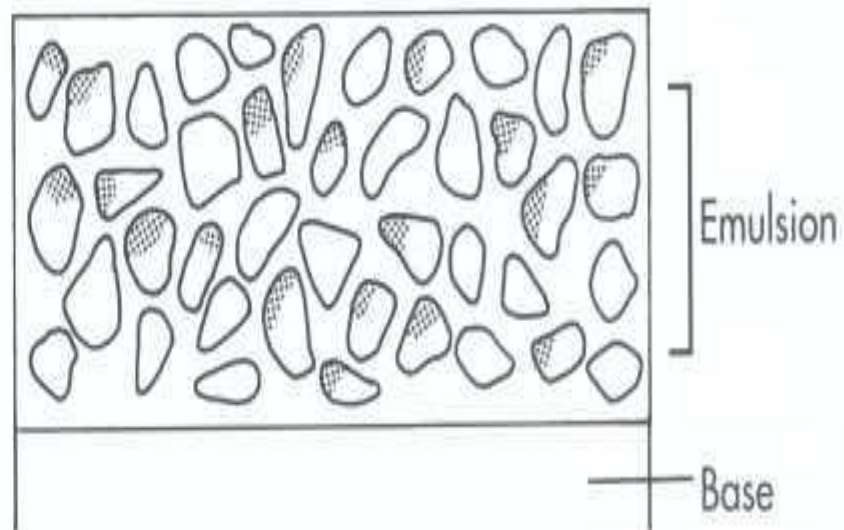
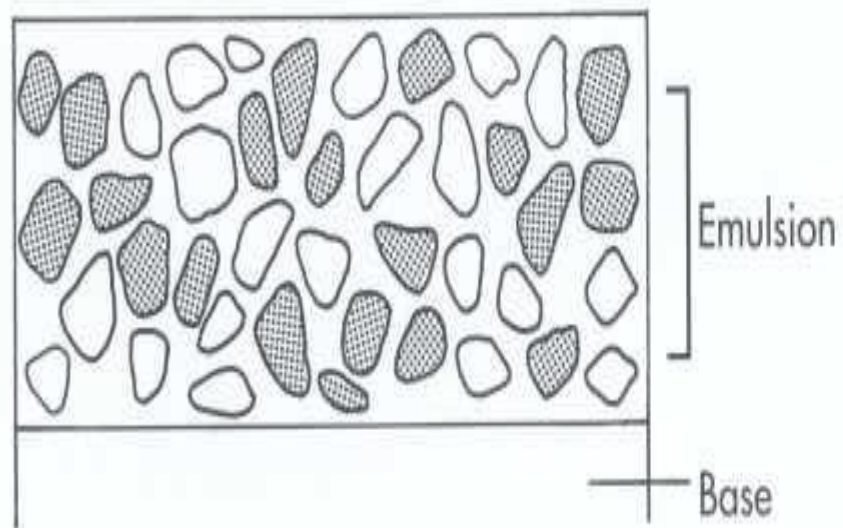
DEVELOPER SOLUTION

The developing solution converts the exposed crystals containing silver particles at the latent image sites into grains of metallic silver

FIXING SOLUTION

The fixing solution and washing procedure

dissolve and wash away the unexposed, undeveloped silver bromide crystals

A**B****C****D**