

Name :- Saira Hassan

ID :- 15315

Paper :- general radiology III

Mam :- Maheen Gul

Bs radiology 3rd semester

X

X

X

Answer No : 01

Calcium tungstate :-

⇒ High X-ray absorption ability and Physically strong but lacks in light conversion ability.

Rate - earth screens :-

other factors can affect screen speed aside from phosphor type.

⇒ Governed by crystal size, phosphor layer thickness, reflective layer efficiency and dyes in the phosphor layer.



## Answer No: 02

Latent image formation:-

⇒ The latent image forming x-ray exiting the patient and incident on the radiographic intensifying screen-film deposit visible light energy in the emulsion primarily by interaction with atoms of the silver halide crystal.

⇒ This energy is deposited in a pattern that is representative of the anatomical part that is being radiographed.

⇒ An invisible image is present, however, and is called a latent image.

⇒ With proper chemical processing, the latent image becomes a visible image.

⇒ Silver halide crystals.

⇒ The silver, bromine, and iodine atoms are fixed in the crystal lattice in ion form.

⇒ Silver atom is missing an electron and therefore is a positively charged ion, identified as  $Ag^+$ .



⇒ Silver is Positive ion, and bromide and iodide are negative ions.

⇒ The bromine and iodine atoms each have one extra electron and therefore are negatively charged ions, identified as bromide and iodide ( $\text{Br}^-$  and  $\text{I}^-$ ), respectively.

⇒ The silver halide crystal is not as rigid as some crystals such as diamonds.

⇒ Therefore, the crystal takes on a negative surface charge, which is matched by the positive charge of the interstitial silver ions, the silver ions inside the crystal.

⇒ An inherent defect in the structure of silver halide crystals, the frankel defect, consists of interstitial silver ion and silver ion vacancies.

⇒ They migrate out of the crystal into the gelatin portion of the emulsion.

⇒ The concentration of electrons of the sensitivity center produces a region of negative electrification.

⇒ After migrating to the sensitivity center, the silver ions are neutralized by electrons and are converted to metallic silver.

⇒ Consequently, this silver deposition is not observable, even microscopically.

⇒ This group of silver atoms is a latent image center. It is here that visible quantities of silver form during processing to create the radiographic image.

⇒ The observable information contained in radiation-activated and inactivated silver halide crystals constitutes the latent image.





Answer No: 03

Radiographic film :-

⇒ Radiographic film

has two parts.

⇒ Base

⇒ Emulsion

⇒ In most x-ray film the emulsion is coated on both sides, therefore, it is called double emulsion film.

Adhesive layer :-

⇒ Between the emulsion

and the base is a thin coating of material called the adhesive layer.

⇒ This adhesive layer allows the emulsion and the base to maintain proper contact and integrity during use and processing.

Overcoat :-

⇒ The emulsion is enclosed by a protective covering of gelatin called the overcoat.

Date: 1/1/20

⇒ The thickness of radiographic film is approximately 156 to 300  $\mu\text{m}$ .

Base :-

⇒ The base is the foundation of radiographic film.

Glass Plate :-

⇒ Radiologists used to refer to radiographs as x-ray plates.

Cellulose Nitrate :-

⇒ A substitute material, cellulose nitrate, soon became the standard base.

Cellulose triacetate :- has properties similar to those of cellulose nitrate but is not as flammable.

Polyester :-

⇒ In the early 1960s a polyester base was introduced.

⇒ Polyester has taken the place

of Cellulose triacetate as the film base of choice.

⇒ Polyester is more resistant to warping from age and is stronger than Cellulose triacetate permitting easier transport through automatic processors.

### Emulsion :-

The emulsion is the heart of the radiographic film.

It is the material with which x-ray or light photons from radiographic intensifying screens interact.

⇒ The emulsion consists of a homogeneous mixture of gelatin and silver halide crystals.

⇒ It is coated evenly with a layer that is 3 to 5  $\mu\text{m}$  thick.

The silver halide crystal is the active ingredient of the radiographic emulsion.



Date: 1 / 20

In the typical emulsion, 98% of the silver halide is silver bromide the remainder is usually silver iodide.

Diagram :-

