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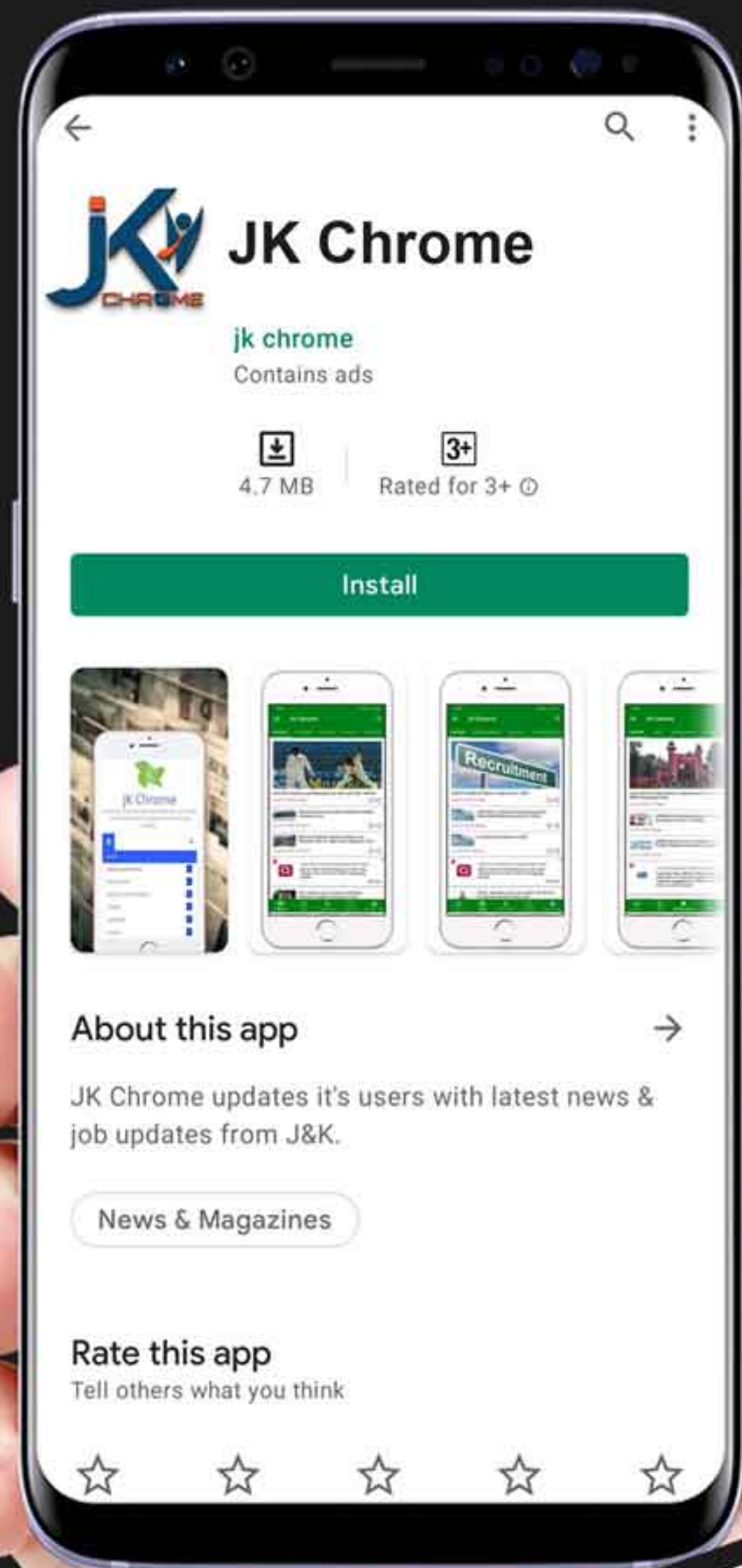
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## Non Metal

In modern periodic table there are 24 non metals. 11 are gases, 1 is liquid (Br<sub>2</sub>) and 12 are solid.

Electronegative elements are non metals.

Non metals are bad conductor of heat and electricity except graphite, Si & Ge are semi conductor.

### Hydrogen (H<sub>2</sub>)

The lightest gas having three isotopes

<sup>1</sup>H<sub>1</sub>, <sup>1</sup>H<sub>2</sub>, <sup>1</sup>H<sub>3</sub>.

Protium is only one isotope in Periodic Table having zero neutron.

Deuterium oxide is known as heavy water and used in nuclear reactor as moderator.

Liquid hydrogen is used as rocket fuel.

Hydrogen is known as range element because it may be kept in group I & group VII A.

### Water (H<sub>2</sub>O)

Hard water – Less froth with soap

Soft water – more froth with soap.

Hard water – Due to the presence of soluble impurities of bicarbonates, chlorides & sulphates of Ca & Mg.

Temporary hardness – Due to the presence of bicarbonate of calcium and magnesium.

Permanent hardness – Due to the presence of chlorides and sulphates of calcium and magnesium.

Temporary hardness is removed by boiling and by Clark's method while permanent hardness is removed by Soda ash (Na<sub>2</sub>CO<sub>3</sub>) process.

Permanent hardness is also removed by permutit process.

## Oxygen

Important constituent of air, exists in three different isotopes.

$^{16}\text{O}$   $^{17}\text{O}$   $^{18}\text{O}$

Ozone ( $\text{O}_3$ ) is the allotrope of Oxygen.

Ozone reduces the effect of ultraviolet rays in the atmosphere.

## Nitrogen

78% by volume in atmosphere, liquid nitrogen is used for refrigeration.

Ammonia is an important compound of  $\text{N}_2$  which is prepared by Haber's process.

## Ammonia

As refrigerent, In the manufacture of  $\text{HNO}_3$ .

In fertilizer like urea, ammonium sulphate etc.

In the manufacture of  $\text{Na}_2\text{CO}_3$  &  $\text{NaHCO}_3$ .

In preparation of ammonium salt.

In preparation of explosive.

In preparation of Artificial silk.

Nitrogen fixation in leguminous plants

## Phosphorous

An important constituent of animals and plants. It is present in bones & DNA.

Phosphorous shows allotropy – White or yellow phosphorous, Red phosphorous, Black phosphorous etc.

White phosphorous is more reactive than red phosphorous.

## Halogens

17th group elements

**Uses of fluorine :** In the preparation of UF<sub>6</sub> and SF<sub>6</sub> for energy production and as dielectric constant respectively.

By using HF, chloro fluoro carbon compound and polytetra fluoro ethylene can be synthesised.

Chlorofluoro carbon is known as Freon used as refrigerent and aerosol.

Non-stick utensil is made up of teflon.

Chlorine is used to prepare PVC, insecticides herbicides etc.

Bromine is used in ethylene bromide synthesis which is mixed with leaded petrol. In the preparation of AgBr which is used in photography.

### **Inert gases**

It belongs to 18th group of P.T.

He, Ne, Ar, Kr, Xe, Rn

Except Rn, all inert gases are present in atmosphere.

Argon is used in Arc. welding & electric bulb.

Helium is light & non-inflammable so, used in balloon, weather indicator etc.

Neon is used in discharge tube glow light.