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Diploma in Pharmacy 1st Year
Social Pharmacy
Experiment

To study the importance/percentage/content of Potassium permanganate, used for the purification of well and tank.

Aim:

To study the importance/percentage/content of Potassium permanganate, used for the purification of well and tank.

Reference :

Dr. Gupta G.D , Dr. Sharma Shailesh , Dr. Sharma Anshu , " Practical Manual of Social Pharmacy " Published by Nirali Prakashan , Pg.No 79 - 82

Theory :

Potassium permanganate is used as an oxidant substance. It has poor disinfectant property. Potassium permanganate is used in wells to control odor, taste and remove manganese and iron from the water. Potassium permanganate is also used to control biological growth in stored water. The Potassium permanganate is used in a pre-treatment of water. Potassium permanganate is found better than chlorine for removing sulfide odors from water.

Properties of Potassium Permanganate

Potassium permanganate is sold as a dry, purple-tinted solid. Potassium permanganate oxidises iron, manganese and hydrogen sulphide which are found as impunities in water. The oxidised impurities can be filtered easily out of water. Potassium permanganate should be kept in an air-tight container. It should be stored in a cool and dry area, away from acids, peroxides, and combustible and oxidisable materials.

Uses of Potassium Permanganate

There are many uses of potassium permanganate.

1) It is used in pre-treatment of water.
2) Potassium permanganate is used to control taste and odors of water
3) It removes colour from the water.
4) Control biological growth in treatment plants and pipelines.
5) It is used in wells to control iron bacteria and other biological growth.

Mechanism of Action of Potassium Permanganate

Potassium permanganate is injected into the water with the help of a device between the pump and holding tank. Almost 3.8 to 7.6 g per gallon of Potassium permanganate is used in cleaning the well which helps to remove iron bacteria from the well. When the mixture is dropped into the well, it is mixed properly into the entire capacity of the well for this agitation is conducted for effective treatment. Agitation is can be conducted by forcing the water to come up through the casing and then splash back down.

After the oxidation of Potassium permanganate in the well there could be chlorine disinfection or Granular Activated Carbon (GAC) and membrane filtration which is also conducted for complete water treatment. In the case of large-scale water treatment processes, potassium permanganate is added at the raw water intake. Potassium permanganate is always added before filtration.

Steps involved in Potassium Permanganate Water Treatment:

In order to use potassium permanganate in water treatment these are the simple steps:

1) Withdraw a sample of water from the tank/well and check the pH. temperature, iron level and manganese levels. The pH of water should be monitored on regular basis.
2) The level of iron and manganese helps to calculate the amount of potassium permanganate to be used If the levels of manganese are high it can be Visually examined, as the water will have a pink tim
3) In case of iron the concentration of 0.94mg of potassium permanganate per mg is used for oxidation

4) In case of manganese the concentration of 1.92mg of potassium permanganate per mg is used for oxidation.
5) Pre-made tabicts can also be used if the person doesn't want to calculate dosage For example, one product advises using one tablet per 50 gallons of water, but dropping back to one tablet per 100 gallons if the individual just want to improve water clarity, such as in a pond. The manufacturer advises using two tablets per 50 gallons of water to treat bacterial and parasite problems.
6) Rate of oxidation depends on the pH of water Iron oxidation occurs within 10 minutes at pH 72 or above, if the pH is 69 it take an hour. Manganese oxidation requires less than one hour at a pH of 9.5 or above.
7) In case of treating taste and odour of the water. doses of potassium permanganate in the range of 0.25 to 20mg per liter are used.
8) Next step is to filter the water to remove the solid residue of manganese dioxide and the precipitate of elemental sulfur that resulted from the treatment with the potassium permanganate
9) Potassium permanganate treatment is commonly paired with a "greensand resin bed system.

Result : The importance/ percentage/ content of potassium permanganate used for the purification of well and tank was studied.