

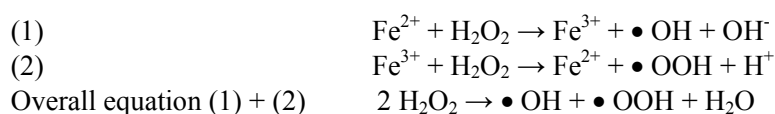
Abstract

The Stonecutters Island Sewage Treatment Works in Hong Kong is seeking further treatment of wastewater. We suggest using Fenton's reagent.

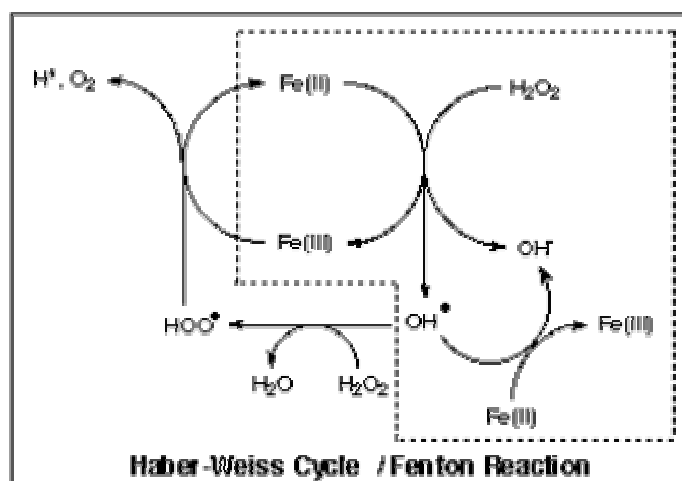
Fenton's reagent has high oxidizing power. It is safer to be used in wastewater treatment than chlorine bleach, which produces toxic chlorine gases.

The following are some suggested principles of Fenton's reagent:

(I)



(II)



(Source: <http://www.madsci.org/>)

The method of water treatment by Fenton's Reagent is green since it is catalytic reactions. Two molecules of hydrogen peroxide are converted into two hydroxyl radicals and water in the net reaction. Hydroxyl radicals decompose organic waste into carbon dioxide and water while excess hydrogen peroxide decomposes into toxic oxygen and water. Iron(II) ions after use which can be recycled for coagulation in wastewater treatment.

In our project, we had studied viability of Fenton's Reagents under different conditions using microscale apparatus and then the light transmittance of coloured organic substances was studied by colorimeter. We also studied the amount of hydrogen peroxide left after the reaction by titration. Comparing different mediums and catalysts, hydrogen peroxide with iron(II) in neutral condition under light was found to be the best. Sunlight is believed to work as well and small amount (0.03 %) hydrogen peroxide was proved to be sufficient.