

Determination of thiocyanate ions in waste water

Student worksheet

The scenario

An industrial plant produces low concentrations of thiocyanate ions as one of its waste products. They are removed from the effluent before it is fed into a nearby river. The Environmental Agency will not allow water with a thiocyanate concentration of above 10 mg dm^{-3} to be fed into rivers.

There has been a recent period of severe cold weather. The company is concerned that this has affected its water treatment plant and reducing its effectiveness at removing thiocyanate ions from waste water.

The company's analysts have checked, but the company is seeking an independent analysis. You have been asked to investigate.

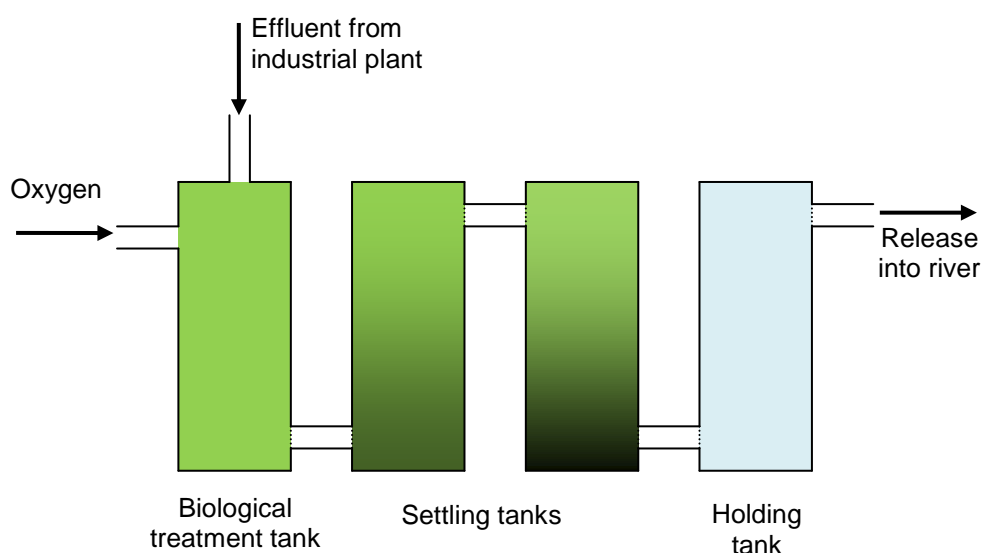


Figure A plan of the waste treatment plant.

What you need to do

- Write a letter to the company that operates the waste water treatment plant requesting samples that you need for analysis. You should specify at what point in the flow of effluent through the plant you would like samples to be taken, how many samples you require and when they should be taken. You should also specify the quantity of each sample needed, how they should be taken and in what kind of container they should be collected.
- When you receive appropriate samples, use the method described in the Student Worksheet: *Determination of thiocyanate using iron(III)* to find out how effective is the treatment of the waste water so that you can decide whether the treated effluent may be fed into the nearby river.
- Write a report to the waste water treatment company summarising your work including a recommendation about whether the effluent should be fed into the river or not. Describe the evidence that your recommendation is based upon and comment on the confidence you have in your results taking account of the percentage errors that may be involved in your analysis procedures.