

# Measurement of phosphate in waste water plants

application note



*8810 phosphate analyser*

## 1 - PHOSPHATE MONITORING IN WASTE WATER PLANTS

Most waste water treatment processes can be decomposed in three stages :

- a. Preliminary treatment to remove big objects from the water.
- b. Primary treatment to get rid of big particulates which can be eliminated by sedimentation.
- c. Secondary treatment to remove fine particulates and chemical contaminants.

To sum-up, preliminary and primary treatment are based on mechanical actions (filtration, sedimentation,...) and secondary treatment on physico-chemical or biological principles.

**The secondary treatment often consists in a two stage process:**

- \* a biological treatment (for biodegradable products elimination),
- \* a physico-chemical treatment (for non-biodegradable pollutants or suspended solids elimination).

Phosphorus contaminants are either organic phosphates (decomposition of vegetals) or orthophosphates (mineral). Normally, 30 to 50% of the total phosphorus is organic and 50 to 70% is mineral.

**Phosphorus can be removed :**

\* **Biologically :**

Bacterias are kept in an anaerobic environment. As soon as they are moved into an oxygenated water their capacity to fix phosphorus is 3 or 4 times higher than usual. Phosphorus trapped by the bacterias forms a mud which is removed from the process.

\* **Chemically :**

Metallic salts (iron, aluminium) or lime are added in the water to be treated and react with the phosphorus to form insoluble matter which can be separated from the water by a flocculation. This phosphorus precipitation, depending on the reagent used, has to be performed at well determined pH values (i.e. with  $\text{FeCl}_3$ , the optimum pH is 5.5).

**In many cases, both biological and chemical treatment are used in the same process. The analyser generally monitors the dephosphatation stage effluent water.**

Normal working range :

The phosphorus concentration values are commonly expressed as mg/l of P- $\text{PO}_4$  (weight of phosphorus contained in the ortho-phosphate part).

Dephosphatation stage output : 0 to 2 mg/l P- $\text{PO}_4$ . Typical working value: 0.7 mg/l P- $\text{PO}_4$ . The average value of total phosphorus (P) at the inlet of municipal waste water plants is around 20 mg/l.

## 2 - SYSTEM CONFIGURATION

The 8810 PHOSPHATE is dedicated to measurement of *ortho-phosphate* in waste water plants and is composed of :

- \* a preparation reactor with auto-cleaning system (sprinkler) and heating device,
- \* a photometric cell,
- \* reagent injection pumps.

368810,XXXXX

8810 PHOSPHATE ANALYSER

The analyser is available for 110 or 220 or 240 VAC  
50/60 Hz power supply.

**OPTIONS**

368810,56000 Automatic chemical cleaning system

368810,40000 Wall mounted fiberglass cabinet

368810,45000 Free standing cabinet

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