# Spectrophotometric determination of PO4-P

## General remarks

Only use Milli-Q water to prepare reagents!

Linear range: 1-500 mg P/L

## Materials used

* Scheel solutions
* Spectrophotometer
* Pipettes and tips
* Test tubes of 20 mL (you can use the old ICP-OES tubes)

## Preparation

1. Scheel solution I: In 125 mL of water, add (successively):
   1. 0.25 g methol (monomethyl-para-aminophenol sulphate) - 14.28
   2. 1.25 g Na2SO3.7H2O (or 0.625 g Na2SO3) - 5.2
   3. 37.5 g NaHSO3 (or 34.25 g Na2S2O5) - 5.3

Then, dilute this further to 250 mL total volume in a volumetric flask by adding water.

1. Scheel solution II:
   1. Dissolve 12.5 g of ammonium molybdate [(NH4)6Mo7O24.4H2O] in 50 mL of warm water, and allow to cool. - ISOFYS
   2. Afterwards add 35 mL of sulfuric acid (with a density of 1.83g/mL).
   3. Quantitatively decant (leave behind remaining solids) to a 250 mL flask, and fill to the mark with water.
2. Scheel solution III:
   1. Dissolve 51.25 g of sodium acetate (NaOAc) or 85 g of sodium acetate-3-hydrate in 250 mL of water. - 3.1
3. Primary solution:
   1. 500 mg P/L: (add 0.5491 g of water-free KH2PO4 in a 250 mL volumetric flask)
4. Calibration series:
   1. Make a series of 0, 2.5, 5, 10, 25 and 50 mg P/L by pipetting 0, 0.25, 0.5, 1, 2.5 and 5 mL of the primary solution to 50 mL flasks and dilute with Milli-Q to the mark.

## Measurement

For measurement of samples, add successively into a test tube (15 mL or more):

1. 1 mL extract or standard
2. 5 mL water
3. 1 mL Scheel solution I
4. 1 mL Scheel solution II (shake energetically to have perfect homogenization and allow to react for 15 min)
5. 2 mL Scheel solution III, shake and allow to react for another 15 min.
6. Transfer an aliquot to a quartz cuvette.

Then, measure the absorbance at 700 nm.

## After measurement

After you have measured your samples, discard the contents of the test tubes in the ACID liquid waste.

The test tubes have to be rinsed twice with demi water, and are then transferred to the acid bath for 24 h of soaking.

After 24h, remove your tubes, rinse them twice with mQ water, and store them bottoms up in a tube rack until dry. When dry, place them back in the ICP-OES tube box.