

## Kjeldahl Digestion Method

*(Total Kjeldahl Nitrogen and Total Phosphorus in water and waste water)*

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### Introduction

This method is adapted for use on LabTech DigiBlock digestion system to provide Kjeldahl digested sample.

### Application

This is an acid digestion procedure to prepare samples for the subsequent determination of TKN (Total Kjeldahl Nitrogen) and TP (Total Phosphorus).

### Apparatus & Equipment

LabTech EHD20-iTouch DigiBlock (Digital sample preparation system).

Digestion tubes of 250ml capacity.

LabTech Fumehood.

### Reagents/Chemicals Required

PTFE boiling chips

De-ionized water.

0.2g  $\text{CuSO}_4$  and 3g  $\text{K}_2\text{SO}_4$

6N Sulphuric Acid--Dilute 167ml of concentrated sulphuric acid to 1 L with reagent grade water

Reagent Grade Water

### Procedure

1. Prepare sufficient 250 ml digestion tubes for the number of samples. All tubes should be washed and rinsed with de-ionized water to keep the tubes clean enough.
2. Add 25ml of sample to one 250 ml digestion tube.



3. Add 0.2g  $\text{CuSO}_4$  and 3g  $\text{K}_2\text{SO}_4$  to the sample tube.
4. Add 20 ml 6N sulfuric acid to the sample tube.
5. Add 4 – 8 PTFE boiling chips to the sample tube.
6. Repeat step 2 to 4 until all samples have been prepared.
7. Transfer all sample tubes simultaneously, using the bracket provided in the LabTech Digestion system, to digiblock EHD20.



8. Set the digestion temperature on 160 °C.
9. Significant fuming will occur in the early digestion process. Keep the reaction on for 1 hour. And then, increase the temperature setting to 380 °C.
10. Keep the reaction on for additional 30 minutes at least.
11. When the digestion is completed, switch off digiblock EHD20. Set aside samples to be cooled down.



12. Cool and dilute to 50 ml with reagent water. The sample is now ready for analysis for TKN and TP.

### **Safety Notes:**

- The DigiBlock digestion system should be located inside the fume hood. It is recommended that the Program Controller be located outside the fume hood.
- Great care should be taken when handling acids. Protective clothing should be worn including gloves and face mask. If acids are spilled on the skin, immediately wash with copious amounts of water. Neutralize any acid spills with sodium carbonate ( $\text{Na}_2\text{CO}_3$ ) or sodium bicarbonate ( $\text{NaHCO}_3$ ).
- Digests must be cool before dilution water is added to avoid a violent reaction during which the acid can shoot out of the flask.