

برنامج اعتماد مشغلي مرافق مياه الشرب و الصرف الصحي
**Certification Program for Water and Wastewater
Treatment Plant Operators and Lab. Analysts**

دليل المتدرب
البرنامج التدريبي لمشغلي محطات تنقية مياه الشرب
المستوى (ج)

**Training Course for WTP Operators
Level C
Trainee Guide**

الجزء الثاني
الاختبارات المعملية

برنامج اعتماد مشغلي مرافق مياه الشرب و الصرف الصحي
Certification Program for Water and Wastewater
Treatment Plant Operators and Lab. Analysts

مشروع دعم قطاع مياه الشرب و الصرف الصحي
ممول من الوكالة الأمريكية للتنمية الدولية

دليل المتدرب
البرنامج التدريبي لمشغلي محطات تنقية مياه الشرب
المستوى (ج)
Training Course for WTP Operators
Level C
Trainee Guide

الجزء الثاني
الاختبارات المعملية

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- يحدد المكان المناسب لجمع عينة.
- يصف تتابع إجراءات الحيازة وأسلوب عنونة العينة
- يذكر طرق الحفظ، ظروف التخزين، والحد المسموح لحيازة العينة .
- يسرد ويصف متطلبات جمع العينة.
- يذكر معدات الحماية الشخصية.
- يشرح إجراءات السلامة لجمع العينات وحفظها .
- يشرح بالتفصيل عملية التعقيم.
- يذكر بإيجاز أساسيات علم الأحياء والكيمياء.
- يذكر مصادر التلوث.
- يشرح متطلبات الجودة للعينات (التكرارات والانقسامات).
- يحدد أنواع العينات.
- يعدد مصادر التلوث.
- يشرح طرق جمع العينات والمعدات المطلوبة.

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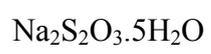
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Na, Ca, B, Si
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Chlorine Demand

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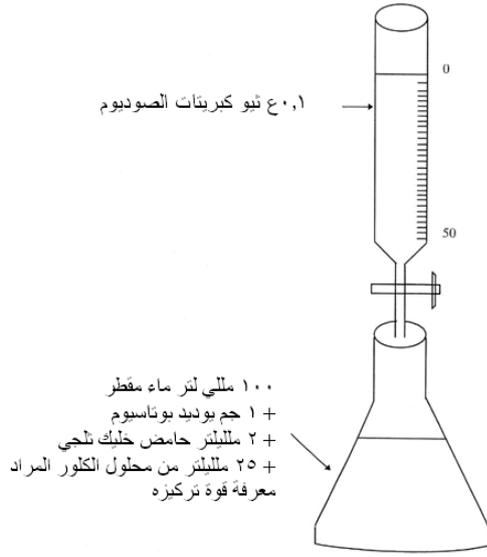
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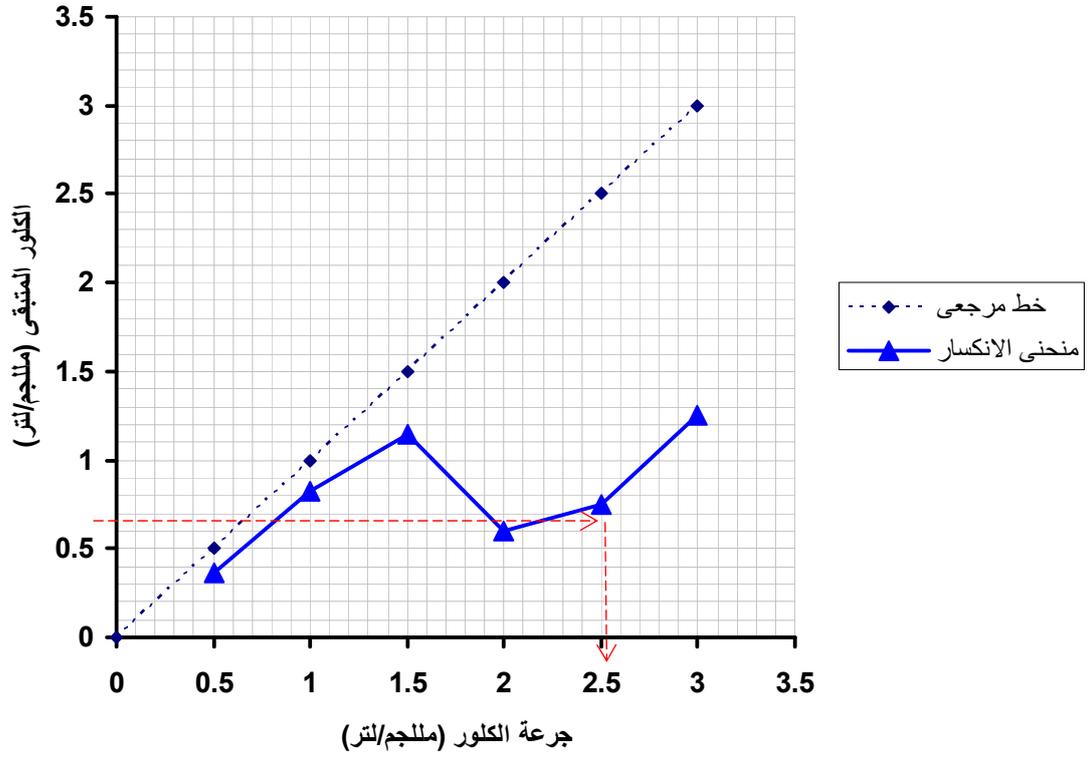
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DPD" n, n-diethyl-p-phenylenediamine"

DPD

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DPD3

DPD4

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Dissolved Oxygen

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Hardness

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E.D.T.A :

EBT

Murexide

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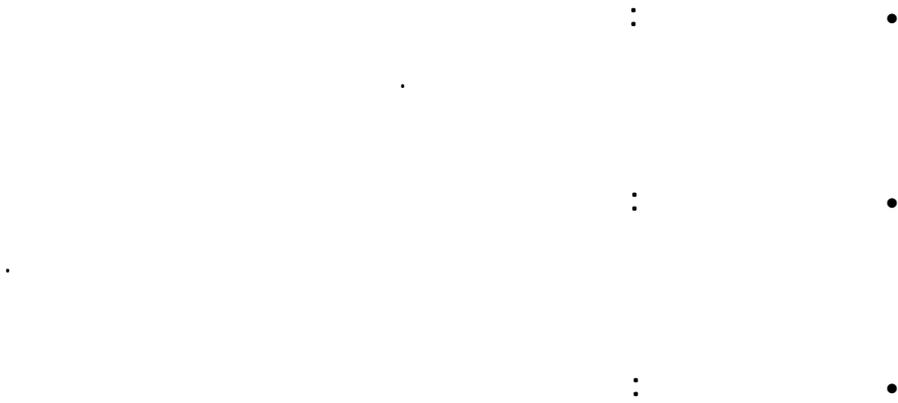
[Inductively Coupled Plasma]

I.C.P

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Organic Chemicals

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1-Water Treatment Plant Operation Vol. II (Office of Water Programs, College of Engineering and Computer Science, California State University, Sacramento)

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Turbidity -

"Cloudiness"

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Turbidity meter " "

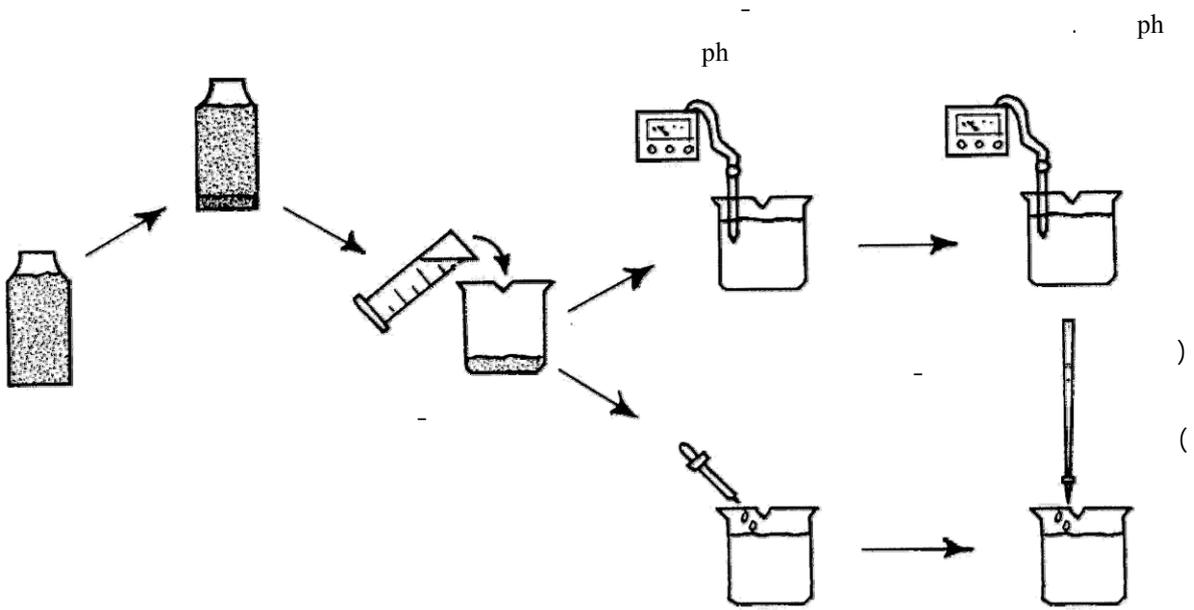
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Temperature

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$$(^{\circ}\text{C} = 5/9 (^{\circ}\text{F} - 32))$$

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(pH)

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pH

$$\text{pH} = -\text{Log} [\text{H}^+]$$

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(OH⁻)

(H⁺)

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.(LSI)

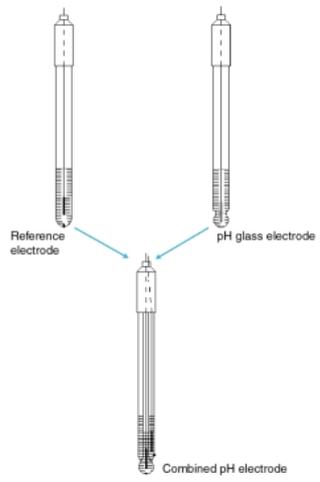
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(Glass electrode-) **pH**
 (Reference electrode)



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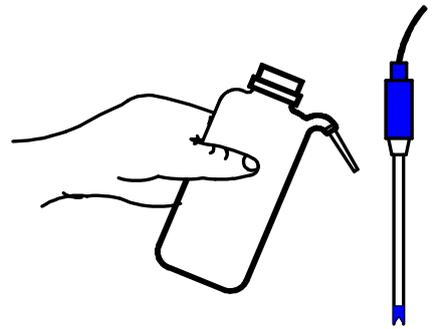
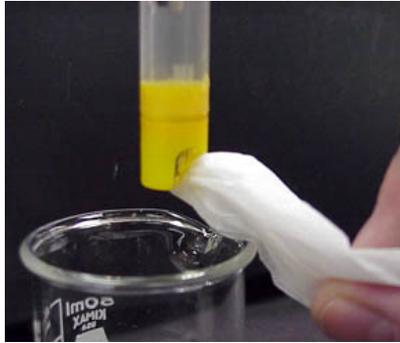
pH

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(pH7, pH4, pH10) Buffer Solution



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.(Linear-Flow hood)

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(Water bath)

(Sensitive balance)

(pH meter)

(Water distillation unit)

(Water deionization unit)

Graduated)

(Pipettes)

(Cylinders)

(Hot air sterilizing oven)

(Autoclave)

(Refrigerator)

(Freezer)

(filter equipment Membrane)

Vacuum flask

vacuum pump

(Binocular microscope)

(Incubator)

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() (Petri dishes) .

(Culture tubes) .

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(Inoculating needles & Loops) .

Platinum-iridium – Nichrome

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(Racks)

(Forceps)

(Bunsen burner)

(Spatulas)

(Laminar-flow)

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التعقيم بالكحول

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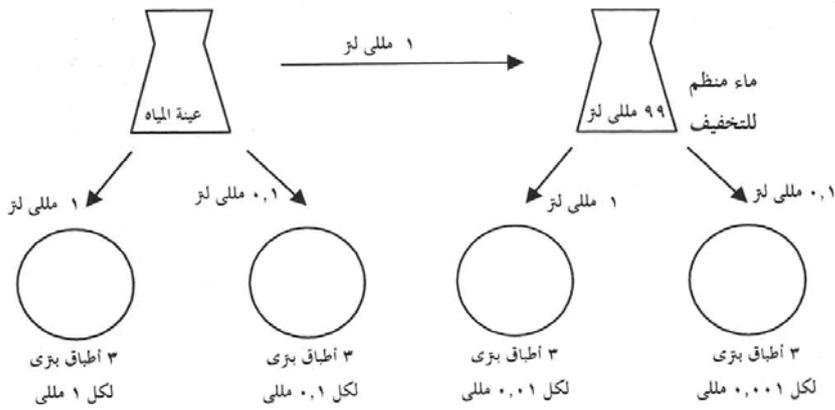
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(Escherichia Coli)

(MPN)

(MF)

(EPA)



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.(Nutrient)

(Standard plate count test)

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(Bacterial cluster)

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(Multiple tube fermentation method)

(Membrane filter method)

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"Complete test"

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."MPN"

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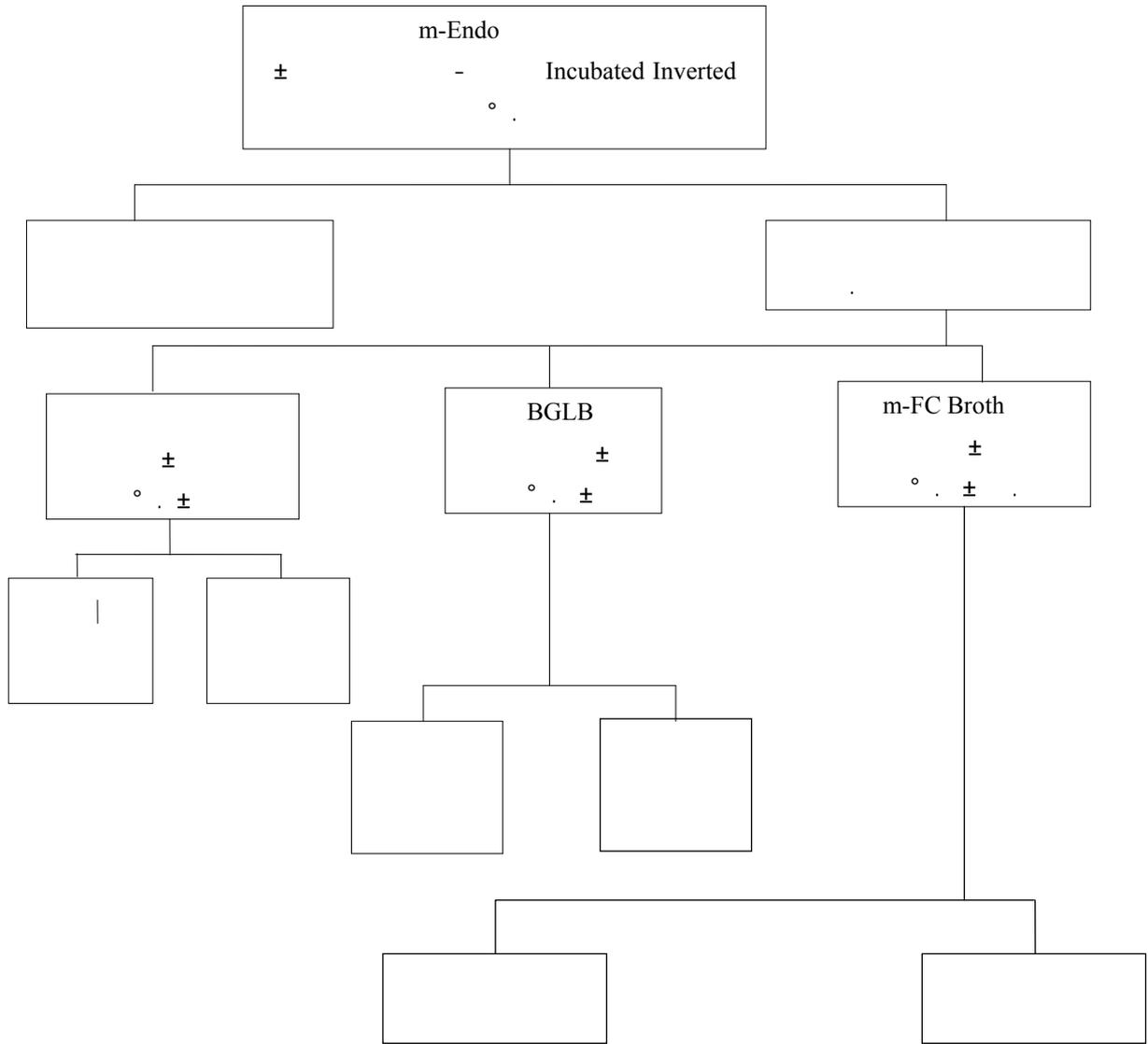
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(Neurotoxin & Hepatotoxin)

(Filter Clogging algae)

(Polluted Water algae)

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(Melosira)

x, 20x, 40x,)
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 (Sedgwick - Rafter slide)
 .(Counting slide)

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 ."Stage (Calibration) micrometer"
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(Whipple plankton - counting disc)

.(Micrometer)

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(Sedgwick rafter cell)

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(Whipple disc)

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(Whipple disc)

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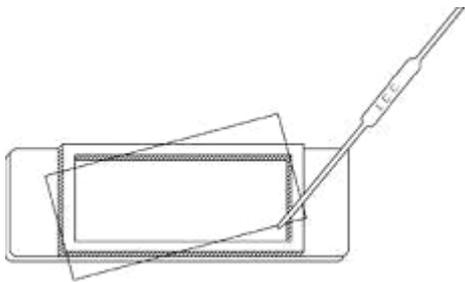
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:(Sedgwick Rafter)

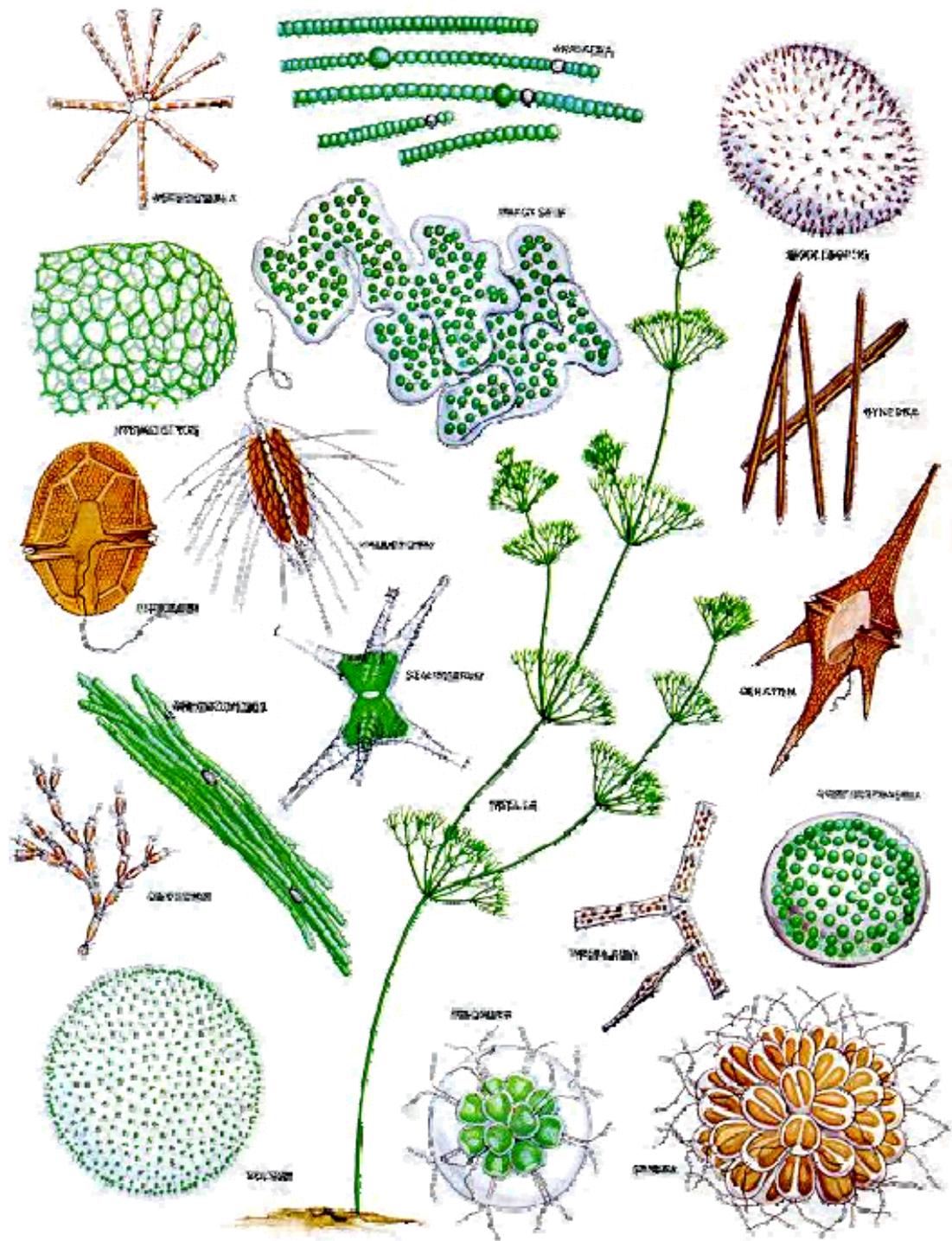


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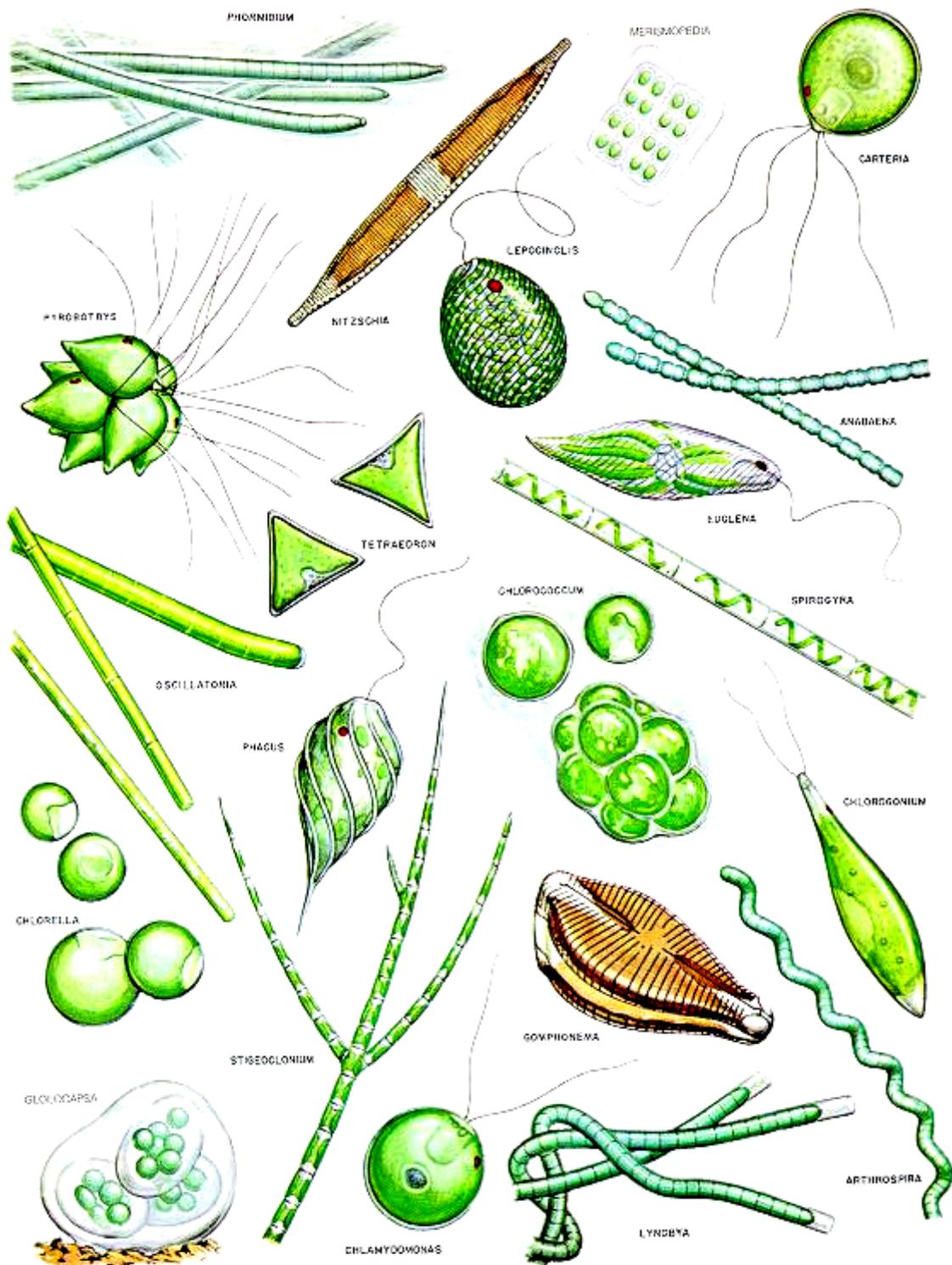
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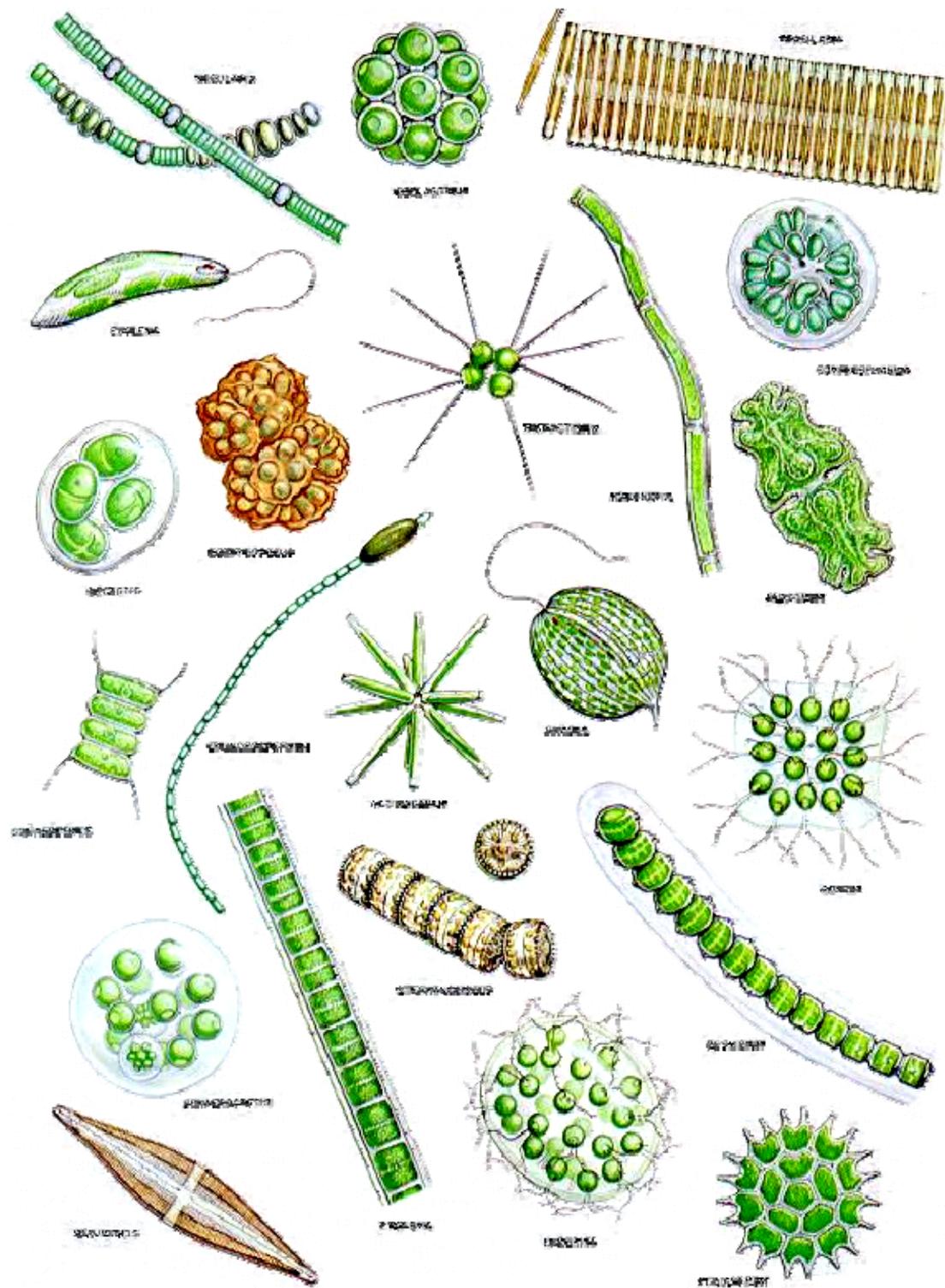
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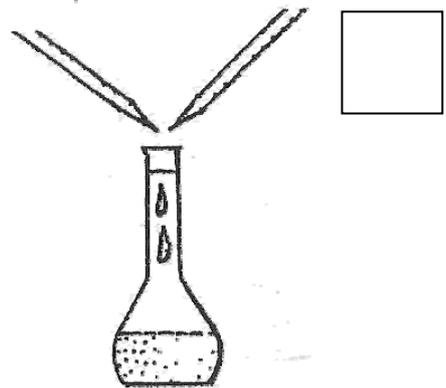
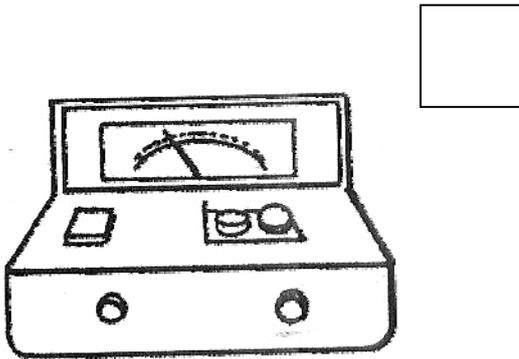
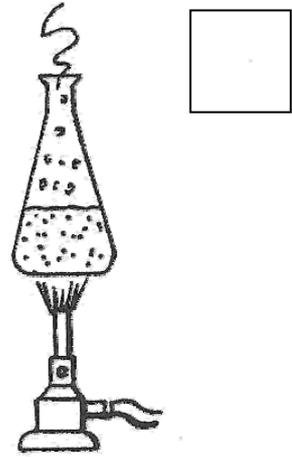
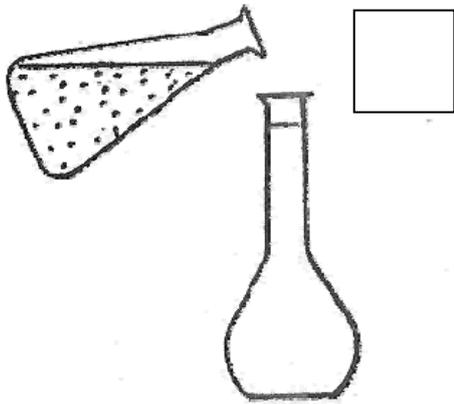
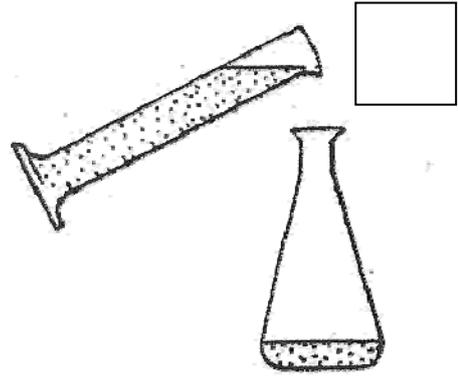
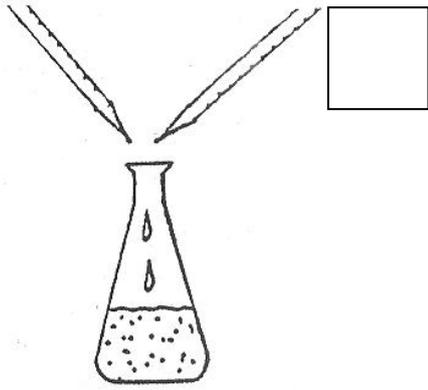
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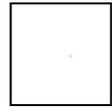
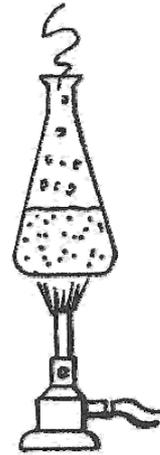
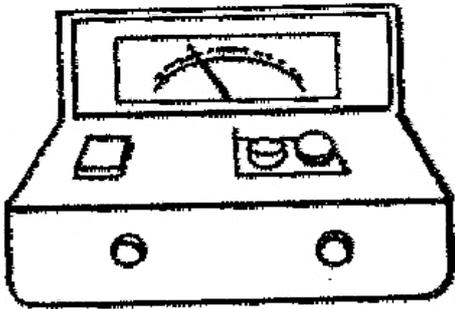
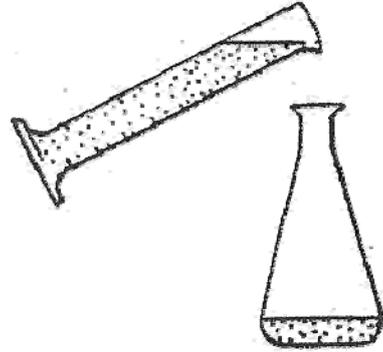
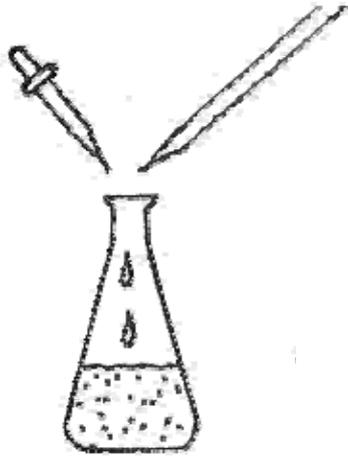
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Manganese green sand

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(Trihalomethan)

(Volatile Organic)

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(Ultrafiltration)



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 Total Solid Content ()
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 - (TSS) - (T.S)
 : (TD)
 $TS = TSS + TD$

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 - (Settleable Solids - NFSS) •
 : (Floatable Solids - FSS)
 (TSS) = FSS + NFSS

- TVS •
 : (TNVS)
 $TS = TVS + TNVS$

- (TVSS) •
 : (TNVSS)
 $TSS = TVSS + TNVSS$

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$$TDS = TVDS + TNVDS$$

N.T.U

(Apparent Color)

(True Color)

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(True & Apparent)

Odor

"Zero Odor"

(Threshold Odor Test)

.Min. Detectable Threshold Odor Concentration

Taste

: Palate Sensory Nerve

Bitter

Salty

Sour

Sweet

Flavor Threshold Test

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(NH⁴⁺)

(OH⁻)

(Fertilizer)

- (Cation - Exchange)

(Degasification)

(H₂S)

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