|  |  |  |  |
| --- | --- | --- | --- |
| **Species/Culture Medium** | Medium 1 | Medium 2 | Medium 3 |
| **Species** A | - | + | + |
| **Species** B | - | - | - |
| **Species** D | - | - | + |

**Guided work: 5**

**Exercise 01:** The results of the different growth tests for 3 bacterial species are given in the following table:

**Medium 2:**

glucose ………………………….10g/L

KH2PO4 ………………………………………13,6 g/L

(NH4)2SO4…………………………………….. 2 g/L

FeSO4 7H2O ……………………..0,5 mg/L

CaCl2 …………………………………………………0,02 g/L

MgSO4 7H2O…………………….. 0,2 g/L

Adjusted to pH 7.0 with NaOH

**Medium 1 :**

KH2PO4 …………………………… 13,6 g/L

(NH4)2SO4 ………………………… 2 g/L

FeSO4 7H2O ………………0,5 mg/L

CaCl2 ………………………………………0,02 g/L

MgSO4 7H2O ……………….. 0,2 g/L

Adjusted to pH 7.0 with NaOH

**Medium3:**

Glucose……………………………… 10g/L

KH2PO4……………………………………………….. 13,6 g/L

(NH4)2SO4 ……………………………………………2 g/L

FeSO4 7H2O ………………………….0,5 mg/L

CaCl2………………………………………………………… 0,02 g/L

MgSO4 7H2O…………………………… 0,2 g/L

Tryptophane………………………….. 0.01g/L

Adjusted to pH 7.0 with NaOH

1- How would you qualify the culture media presented above?

2- What is the role of: glucose, (NH4)2SO4, tryptophan in the culture medium? Explain each case.

3- In which medium can we expect growth for the strain B.?

**Exercise 02: Analysis of Trophic Types of Bacterial Strains**  
Analyze the trophic types of strains I and II using culture media A, B, and C (the composition of the media is provided in g/L).

**Milieu A**

Phosphate d’ammonium…………………………0.2

Phosphate monopotassique………………………1

Sulfate de magnésium……………………………………..0.2

Chlorure de calcium……………………………………………0.1

Chlorure de sodium……………………………………………5

**Milieu B**

Milieu A + Citrate trisodique 2

**Milieu C**

Milieu A + les additifs suivants :

Biotine ……………………………………………………….10-6

Histidine………………………………………………………10-5

Méthionine……………………………………………….2.10-5

Thiamine …..…………………………………………………10-6

Pyridoxine……………………………………………………….10-6

Acide nicotinique…………………………………………..10-6

Tryptophane………………………………………………..2.10-5

Pantothénate de calcium……………………………………..10-5

+ Oligoéléments

+ glucose ……………………………………………………..5

|  |  |  |  |
| --- | --- | --- | --- |
| **Souche pure** | **A** | **B** | **C** |
| I | - | + | + |
| II | - | - | + |

**1.1- How would you classify medium A?  
1.2- Some bacteria might grow in medium A if incubated in an atmosphere enriched with CO2. Explain why and indicate their trophic type in relation to carbon.**

**2.1- What is the trophic type of strain I in relation to carbon and specific nutritional requirements?  
2.2- What is its nitrogen source?  
2.3- It is recommended not to inoculate medium B from a broth or peptone water but rather from a colony on an agar medium. Explain why. Which agar medium with the same composition as medium B do you know?**

**3.1- What does glucose provide in medium C?  
3.2- What is the trophic type in relation to carbon and energy metabolism?  
3.3- Define and explain the presence of trace elements.  
3.4- Which trace element is essential for *Corynebacterium diphtheriae* to produce its toxin?  
3.5- The additive components of medium C belong to two distinct chemical groups. Which ones?  
3.6- To which category do these components belong? Provide a definition.**