Question bank for (Aquatic chemistry ,2023-2024), 4th year students, Soil and Water Department, College of Agricultural Engineering Sciences, Salahaddin University -Erbil, IKR.

Q1: Write (5) goals of studying aquatic chemistry.

Q2: What is the relation between water quality and water suitability?

Q3: What is the relation between water quality and water chemistry?

Q4: Draw the pyramid of aquatic chemistry.

Q5: What is the relation between aquatic chemistry and Environmental chemistry?

Q6: Mention and draw the mechanism of dissolving salts in water.

Q7: Enumerate factors affecting on chemical composition of water.

Q8: There are two models for expression on SAR? Why?

Q9: The SAR value is very low for waters in Kurdistan, explain it.

Q10: Why Adj.SAR is differing from SAR?

Q11: What is the unit of SAR?

Q12: Define saturation index, then explain its importance in soil and water sciences.

Q13: Mention the factors affecting on Cax.

Q14: What are factors affecting on Adj.R_{Na}?

Q15: Mention the factors affecting on pHc value of water.

Q16: Compare between pHc value of rainwater and groundwater.

Q17: Explain the mathematical model for determining saturation index in detail.

Q18: What is the difference between $mmol_c\ L^{-1}$ and meq L^{-1}?

Q19: What is your idea about RSC value for water in Kurdistan region?

Q20: What is the expect CO3 value of water in our country?

Q21: Compare between SSP and SSPP.

Q22: How do you test the accuracy of data?

Q23: What is the dominate water type (Family) in Kurdistan? Why?

Q24: Increase in -------- causes - --------in Adj.SAR while increase in causes -------in it.

Q25: If the pHc value of water less than ------- causes ----------of calcium carbonate in the soil, while if less than---------- causes ---------- calcium carbonate in the soil.

Q26:The Ayers and Westcot (1994) regards as a most important classical method of irrigation water classification due to the following reasons:

1----------2----------3----------

4----------and 5----------.

Q26: Mention the disadvantages of USSR classification.

Q27: The Richards (USDA) classification (1954) classified the irrigation water into ----------classes depending on ----------and ----------.

Q28: The irrigation water classification which are depending on water quality and soil properties are----------,----------,----------and ----------.

Q29: The irrigation water classification which are depending on water quality and soil physical properties are ----------,----------and ----------.

Q30: The irrigation water classification which are depending on water quality and soil chemical property is ----------.

Q31: The irrigation water classification which are depending on water quality and type o soil minerals is ----------.

Q32: The irrigation water classification which are depending on water quality and method of irrigation is ----------.

Q33: The water sample was analyzed and you are given the following information:

Ions	Concentration	Unit
Ca^{2+}	5.00	(mmol L^{-1})
Mg^{2+}	4.00	
Na^{+}	0.50	
K^{+}	0.50	
HCO_3^{-}	6.00	
CO_3^{2-}	?	
SO_4^{2-}	2.00	

Cl^-	?	
EC	1.90	dS m^{-1}
pH	7.78	

Classify the water depending on:
1- Richards (1954) classification. 2- Donen (1954) or Salinity potential.
2- Wilcox (1955) or RSC. 4- USSR classification.
5- Calculate Adj.SAR. 6- Calculate Adj.RNa. 7- Calculate Saturation index. 8-Test accuracy of data. 9-What is the expected CO_3 concentration? Why? .
10-Calculate salt composition. 11- Which of the salts had the highest risk on emitters clogging? Why? 12-What is the water family?

Q34: The water sample was analyzed and you are given the following information:

Ions	Concentration	Unit
Ca^{2+}	200	(mg L^{-1})
Mg^{2+}	96	
Na^+	11.5	
K^+	19.5	
HCO_3^-	732	
CO_3^{2-}	0.0	
SO_4^{2-}	384	
Cl^-	?	
EC	?	dS m^{-1}
pH	7.90	

Classify the water depending on:
1- Richards (1954) classification. 2- Donen (1954) or Salinity potential.
2- Wilcox (1955) or RSC. 4- USSR classification.
5- Calculate Adj.SAR. 6- Calculate Adj.RNa. 7- Calculate Saturation index. 8-Test accuracy of data. 9-Calculate salt composition.
Q35: Define threshold value for ECiw, then mention factors affecting on it.

Q36: Compare between threshold value for irrigation water and soil extract.

Q37: The water quality affects on plants by different mechanisms, explain them.

Q38: Discuss USDA classification (1954) in detail.
Q39: Discuss the effect of temperature on the statistical relation between ECe and ECiw.
Q40: Comment on the following scientific phrases:
1- The irrigation EC threshold value is not constant.
2- The disadvantages of water classification systems.
3- What are the weak points in water classifications depending on IWQI?

Q41: Calculate the relative yield and decrease in yield for barely plant if you are given the following information:
ECe = 12 dS m^{-1}.
EC0 = 30 dS m^{-1}.
The threshold or *EC100 value* = 8 dS m^{-1}.
Q42: Compare between the two models of determine relative yield.

43: What is the relation between water chemistry and plant types?

Q44: Why the water quality not effects on soil pH?

Q45: Mention the factors affecting on the relation between ECe and ECiw.

Q46: Why the Mg/Ca ratio is irrigation water is high but in soil after irrigation is low?

Q47: Explain briefly the relation between aquatic chemistry and soil physical properties.

Q48: Explain briefly the relation between aquatic chemistry and soil microbial activities.

Q48: Which of modern water classification regards as the best one? Why?

Q49: Who modified the IWQI model in the world depending on ion pair, activity and local weight?

Q50: give an example about decrease in yield depending on the model below:
$Yr = 100 - b(ECe - a)$
Where a = the salinity threshold expressed in dS m^{-1}; b = the slope expressed in percent per dS m^{-1}, and ECe = the mean of electrical conductivity for the saturated paste taken from the root zone.
Q51: Enumerate the classical water classifications.
Q52: Which water classification includes two soil physical properties?

هیوای سەرکەوتنتان بۆ دەخوازم

A.O. Esmail

Dr. Akram Othman Esmail

Professor of Soil and Water Chemistry.

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