

Review for test #2- Solutions, Electrolytes and pH

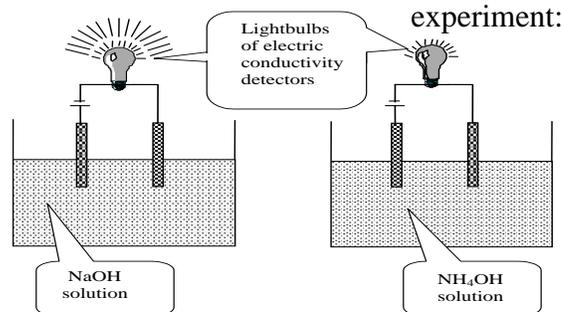
Multiple Choice

1. We wish to demonstrate that some substances conduct electricity in certain situations. What substance must we add to distilled water to demonstrate this fact?
A) Vegetable oil B) Lemon juice C) Icing sugar D) Food colouring
2. Scientists discovered that a certain bacterium grew best in a slightly alkaline (basic) environment. The table below gives the pH value of each environment in which this bacteria was cultivated.

pH Values in the Environments Tested

Environment	pH
1	2.4
2	6.1
3	7.6
4	13.2

- In which of these environments did this bacterium grow best?
A) Environment 1 B) Environment 2 C) Environment 3 D) Environment 4
3. Following a chemical spill, the contaminated soil reaches a pH value of 10. After a few days, a neutralization process begins and a second test is conducted. Its results show that the pH of the soil has become 10 times more acidic. What is the pH value after the second test?
A) pH= 1 B) pH= 7 C) pH= 9 D) pH= 11
 4. In a laboratory, you are testing the electric conductivity of two solutions: a solution of sodium hydroxide, NaOH, and a solution of ammonium hydroxide, NH₄OH. The diagram below illustrates this experiment:



The light bulb of the conductivity detector immersed in the NaOH solution is brighter than the light bulb of the detector in the NH₄OH solution. Which of the following conclusions can you draw from this experiment?

- A) The molecules of NH₄OH do not dissociate.
- B) The molecules of NaOH undergo more dissociation than NH₄OH.
- C) All the molecules of NH₄OH dissociate.
- D) The NaOH and the NH₄OH dissociate the same amount.

5. The most widely sold dairy products on the market are pasteurized milk, cheese and yogourt. The pH of each of these products is given below.

Dairy product	pH
Cheese	7.5
Pasteurized milk	6.5
Yogourt	4.5

The most acidic of these products is how many times more acidic than the pasteurized milk?

- A) 2 times more acidic
 B) 10 times more acidic
 C) 20 times more acidic
 D) 100 times more acidic

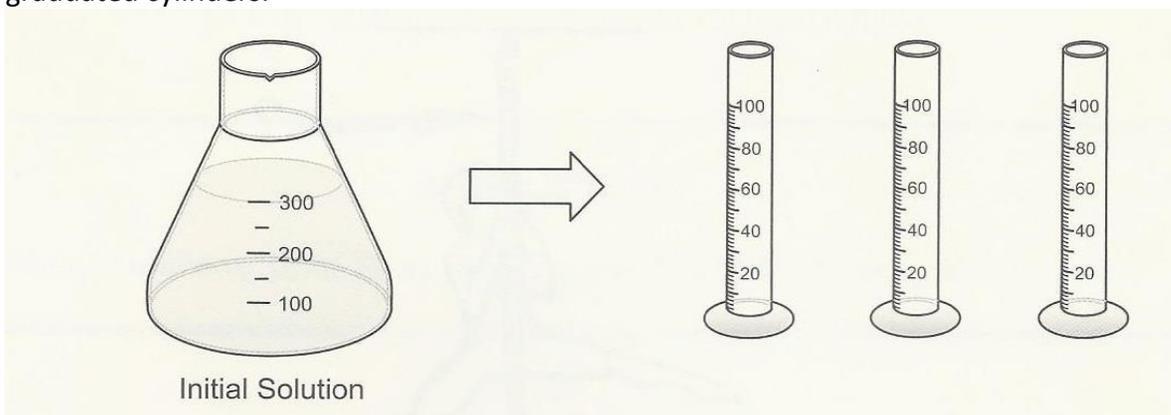
6.

Solution	Quantity of NaCl in the given solution (g)	Volume of the solution (mL)
1	5.0	500
2	4.0	200
3	0.5	100

Given the information in the table above, which sequence shows the solutions written from the lowest to the highest concentration?

- A) 1, 2 and 3
 B) 2, 1 and 3
 C) 3, 1 and 2
 D) 3, 2 and 1

7. An Erlenmeyer flask contains 300 mL of an initial solution with the concentration of 90 ppm. A student transfers equal amounts of this solution into three identical 100 mL graduated cylinders.

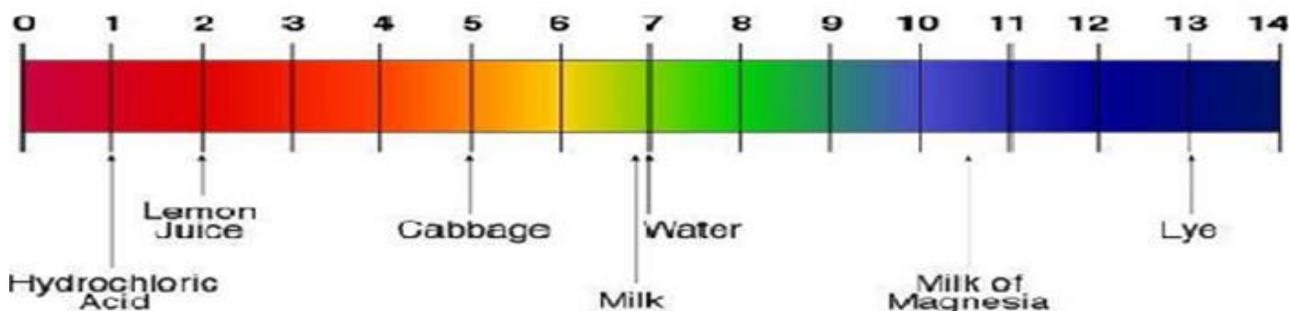


Which of the following choices (A, B, C or D) correctly indicates the effects of this transfer process on the concentration of the solution and the quantity of solute in one of the 100 mL graduated cylinders when compared with the initial 300 mL solution in the Erlenmeyer flask.

	Effects on the concentration of the solution	Effects on the quantity of solute
A	None	None
B	None	Decreases it
C	Decreases it	None
D	Decreases it	Decreases it

Short Answer

8. The following table consists of various products. Use the table below to answer the questions.



The pH Scale

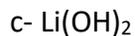
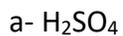
- Which substance is the most acidic?
- Which substance is neutral?
- You would like to neutralize 40 mL of cabbage juice. You are told the only thing available to neutralize the cabbage juice is the milk of magnesia. Explain if you would use more than 40 mL, 40 mL exactly or less than 40 mL to neutralize the cabbage juice.

9. Sabrina must prepare 100mL of a salt solution with a concentration of 20g/L. After having calculated the mass of salt required to prepare the solution, Sabrina prepares the solution.

Choose the correct operations, in order, that she must perform to prepare the solution:

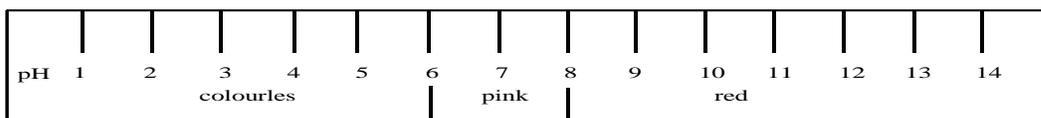
- She weighs the solute.
- She measures 100 ml of distilled water.
- She adds 50 ml of the distilled water to the flask.
- She stirs the mixture to dissolve the solute.
- She places the solute in a flask.
- She adds distilled water to the flask, up to the 100 ml mark.

10. Correctly classify each molecule as an acid, base, salt or non-electrolyte.

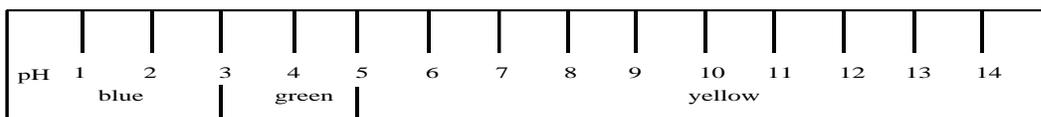


11. From his experiments, Terry has already prepared colour charts for two indicators as shown below. Answer the questions using the chart below. /4

Indicator 1



Indicator 2



- a- Which indicator would allow you to more easily identify acids, bases and neutral solutions?
- b- What is the pH of a substance if it turned colourless when mixed with indicator 1 and yellow when mixed with indicator 2?
- c- Using indicator 2, which colour gives you a result in the acidic, basic and neutral range?
12. Maude is taking care of the family swimming pool over the summer. She carries out a test and sees that the pH of the water is 8.2. Since the pH value is too high, she must add one of the following products to the pool water: NaOH, HCl or H_2O . Which product should she use? Justify your answer.

13. Different lakes are being tested for contaminants that are found in the water. Contaminant's 1 lethal dose is 0.004 ppm and contaminant's 2 lethal dose is 3.5%.

Below is a table that has the different contaminant results from 3 different lakes

	Contaminant 1	Contaminant 2
Lake 1	0.5 g/L	13 g/L
Lake 2	0.04 ppm	12%
Lake 3	16 %	6 mg/L

Determine which lakes are contaminated.