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Dialysis of body fluids

Task 1

The purpose of this activity is to perform the dialysis of milk and verification of the correctness of the process by the determination of selected components in the dialysis solution.

Procedure

Wet dialysis tube section (length 25 cm) derived from hydrated cellulose (Nadir) with distilled water. Close one of the ends of the tube with a seal clip.

Pour the 50 cm^3 of milk (accurately measured volume) to the prepared dialysis bag. Close the second end of a tube filled with milk using a clip, leaving some space over the layer. Rinse the outer part of a bag (where could be any traces of milk) with distilled water from a wash bottle. Use the graduated cylinder to measure 200 cm^3 of distilled water (the liquid before dialysis) and pour the water to the beaker, which will be used for dialysis. Insert dialysis bag into beaker. Perform dialysis for 30 minutes in room temperature, gently moving the bag from time to time.

Perform the tests according to the table:

	Solution before dialysis	Solution after dialysis	milk
Detection of Cl^-			-
Detection of Ca^{2+}			-
Detection of PO_4^{3-}			-
Detection of lactose			-
Detection of protein			

Detection of Cl^- ions

Add by drops 0,5 cm^3 of 0,1 mol/dm^3 $AgNO_3$ to 1 cm^3 tested dialysis solution. In the presence of Cl^- ions white, iridescent AgCl appears.

Detection of Ca^{2+} ions

Add 0,5 cm^3 0,2 mol/dm^3 of ammonium oxalate $(NH_4)_2C_2O_4$ to 1 cm^3 tested dialysis solution. A crystalline calcium oxalate is precipitated.

Detection of PO_4^{3-} ions

Add 5 drops of concentrated HNO_3 and 0,5 cm^3 of 0.1 mol/dm^3 ammonium molybdate to 1 cm^3 tested dialysis solution. Warm the solution gently over the burner until the appearance of yellow precipitate, which indicates the presence of ammonium phosphomolybdate $(NH_4)_3PMo_{12}O_{40}$

Detection of lactose

Add 0,5 cm^3 of Fehling's reagent I and 0,5 cm^3 of Fehling's reagent II to 1 cm^3 of tested dialysis solution. Boil the solution gently over the burner until the appearance of yellow, orange or red precipitate of copper oxide (I) Cu_2O.

Detection of protein (biuret method)

Add 2 cm^3 of copper reagent to 0,5 cm^3 of tested dialysis solution.

Analogously, perform the test on the presence of the protein in the milk. For this purpose, add 2 cm^3 of copper reagent to 0,5 cm^3 of milk derived from dialysis.

Compare the colors that appeared in both samples. If the solution turns violet, protein is present.