UNIVERSITY of LIFE SCIENCES in Lublin
FACULTY OF VETERINARY MEDICINE

DEPARTMENT OF BIOCHEMISTRY
20-033 Lublin, Akademicka 12
Phone +48 81 445 66 08
www.biochwet.up.lublin.pl

Adsorption on medical carbon

Task 1

The purpose of this activity is to perform the adsorption of organic acids (acetic acid) on activated carbon and to demonstrate medical properties of *carbo medicinalis*.

Procedure

Dilute 0,5 mol/dm^3 of acetic acid with distilled water in the conical flasks (marked as A and B) in accordance with the following table:

Flask	CH_3COOH 0,5 mol/dm^3	H_2O	Concentration
A	12 cm^3	38 cm^3	
B	3 cm^3	47 cm^3	

From flask A take 10 cm^3 of acetic acid solution and transfer to the new one (marked as A1) and from flask B move 10 cm^3 of the solution to the new flask marked as B1.

Add a few drops of phenolphtalein to flasks A1 and B1 and then titrate each of them with standard solution of NaOH (0,1 mol/dm^3).

Calculate the real concentrations of obtained acetic acid solutions, using the following formula:

$$C_{CH3COOH} \cdot V_{CH3COOH} = C_{NaOH} \cdot V_{NaOH}$$

Add 1 g of activated carbon to the flasks A and B (please weigh the carbon precisely), and then gently shake them for 30 minutes. After that, filtrate the contents of the flasks. Take 10 cm^3 from each flask and put in the new conical flasks marked A2 and B2. Add the indicator (phenolphtalein) and titrate with 0,1 mol/dm^3 of NaOH solution. Calculate the concentration of acetic acid in the flasks after adsorption.

Knowing the concentration values of the acid before adsorption (C_0) and after adsorption (C), calculate the number of moles of acetic acid, which has been adsorbed by 1 gram of activated carbon.

$$X_A = (C_0 - C) \cdot V_A \quad ; \quad X_B = (C_0 - C) \cdot V_B$$

where:

X – number of moles of adsorbed acid,
V – volume of the solution, for flasks A and B: V = 40 cm^3
C_o – concentration of the acid before adsorption [mol/dm^3]
C – concentration of the acid after adsorption [mol/dm^3]

Note the results in the table:

Flask	A	B
C_0 - concentration of the acid before adsorption [mol/dm^3]		
C - concentration of the acid after adsorption [mol/dm^3]		
X – number of moles of acetic acid adsorbed by 1 gram of activated carbon		

Compare the influence of acetic acid concentration on the adsorption abilities of activated carbon.