Conductivity of solutions

1. The scope of the material:

Electrolytic dissociation, chemical bonding and conductivity of solutions.

2. Literature:

Z. Kurzawa, Chemia – skrypt PP
E. Szyszko, Instrumentalne metody analizy
M. Weller, T. Overton, J. Rourke, F. Armstrong, Inorganic chemistry, Oxford University Press, 2018
C.E. Housecroft and A.G. Sharpe, Inorganic chemistry, Pearson, 2018

Attention!
Ask the teacher to start the conductivity meter before starting the measurements.
After the laboratory classes pour the glycerine back into the bottle - do not pour it down the sink.

3. Execution of the exercise:

Apparatus:

conductivity meter

Laboratory equipment:
polyethylene dish, wash bottle, beaker.

Reagents: 0.01 M KCl, 0.02 M KCl, acid and salt solutions, glycerine.

a. Determination of the vessel constant

Transfer approximately 45 mL of 0.01 M or 0.02 M KCl into a polyethylene dish and measure its conductivity with use a conductivity meter. Determine the vessel constant (**k**) from the formula:

$$k = \frac{x}{y}$$

x – specific conductivity of the potassium chloride solution:
0.01M – 0.001413 $\Omega^{-1}cm^{-1}$
0.02 M – 0.002768 $\Omega^{-1}cm^{-1}$,
y – measured conductivity.

b. Study of water conductivity

Measure the conductivity of double distilled water and tap water. Calculate the specific conductivity χ using the formula:

$$\chi = y \cdot k$$

y – measured conductivity,
k – vessel constant.

c. Study of the conductivity of salts and acids

Determine the specific conductivity of the following solutions:

0.1 M HCl,	0.01 M HCl,
0.01 M NaCl,	0.01 M CH_3COONa,
0.01 M CH_3COOH,	glycerin (glycerine should not be poured down the sink).