

PEG are shown in Figures 3 and 4. The bands due to the C–O stretching mode were merged in the very broad envelope, centered on 1242 and 1089 cm^{-1} arising from C–O, C–O–C stretches, and C–O–H bends vibrations of CuCl_2 in PEG [22, 25, 26].

The IR spectra have shown the existence of the van der Waals interactions between the chain of PEG and CuCl_2 . The shift of peaks corresponding to the vibrations of the carbonyl group of the polymer to the lower frequency region is due to the formation of the coordination bond due to the donor – acceptor interaction between the O atom of the PEG polymer ligand and ions Cu(II) .

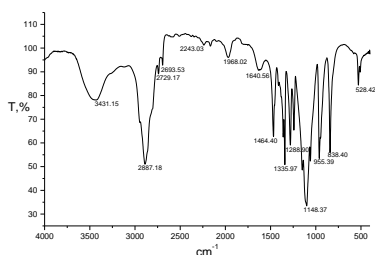


Figure 3 – The IR – spectrum polyethylene glycol

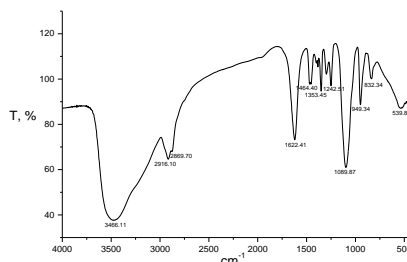


Figure 4 – The IR – spectrum of the complex CuCl_2 -PEG

As seen from the IR spectra (Figures 5 and 6), the peak characteristic of the C=O bond in PVP becomes asymmetric after the addition of metal chlorides, which indicates a strong interaction between PVP and Cu(II) ion in the PVP- CuCl_2 complex. The IR spectra of the studied complex based on copper (II) chloride and PVP contain a band at 3400 cm^{-1} , which is characteristic of PVP. The carbonyl group in PVP is characterized by a peak at 1651 cm^{-1} , broadened due to the C=N bond in the lactam ring. This band shifts to $1510\text{--}1645\text{ cm}^{-1}$ in the complex [21, 22, 27, 28].

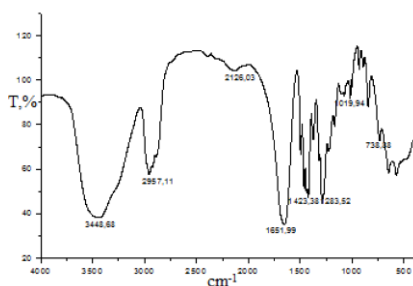


Figure 5 – The IR-spectrum polyvinylpyrrolidone

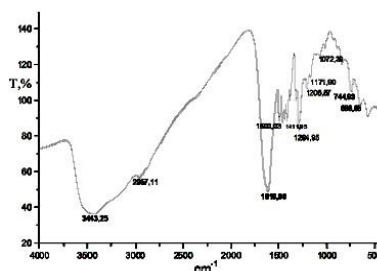


Figure 6 – The IR-spectrum of the complex CuCl_2 -PVP

The differences in the IR spectra of PEG and the PEG- CuCl_2 complex, as well as PVP and PVP- CuCl_2 coordination compound, are observed as a result of the donor-acceptor interaction between the O atom in the PEG and PVP polymer ligands and the metal ion.