



Contribution ID: 337

Type: Oral

## Structural changes of fullerene clusters in polar / non-polar solvents

The clusterization of fullerene C70 in different nitrogen-containing solvents associated with specific features of this class of solvents regarding the interaction with fullerenes. Solutions of fullerene C60 and C70 characterized by the evolution of their ultraviolet-visible, infrared and Raman spectra. This can be explained by effect to a great difference in the polarity of the liquid components, which determines different solvent-solute interaction with respect to the formation of charge-transfer complexes and, thus, provides conditions for selective solvation. It is known the dilution of C60/N-methyl-2-pyrrolidone (NMP) systems by toluene or water leads to cluster reorganisation [1]. The goal of this work is to study composition and structure of the fullerene C70 clusters in NMP solvent after addition of two differently polarity solvents (toluene,  $\epsilon = 2.37$ , and water,  $\epsilon = 78$ ), by means of UV-Vis spectroscopy, Small-Angle Neutron Scattering and Dynamic Light scattering for clarify more deeply into the mechanism of aggregation in the system.

[1]. Y. Prylutsky, V. Petrenko, O. Ivankov, O. Kyzyma, L. Bulavin, O. Litsis, M. Evstigneev, V. Cherepanov, U. Ritter, A. Naumovets, *Langmuir*, 30, 3967-3970, (2014).

### Summary

Our results confirm presence of some aggregates in the solutions. It was noted that with a third component of more than 80%, the clusters are reorganized.

Addition of the water to the new system C70 / NMP accompanied by growth of aggregates, in contrast with previous data, obtained for the system C70 / NMP in 3 weeks after preparation [2]. It can be explained by create of charge-transfer complexes between molecule of fullerene and NMP.

[2]. T.V. Nagorna, O.A. Kyzyma, D. Chudoba, A.V. Nagorny, *J. Mol. Liq.* 235, 111–114 (2017).

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**Track Classification:** Condensed Matter Physics