EuChemS-DAC Study Group / Task Force Annual Report for 2018-2019

Study Group / Task Force Name: **Nanoanalytics**

Study Group / Task Force Members and Affiliations:
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Objectives: The aim of the Nanoanalytics Task Force is to start a dialog within the analytical chemistry community on the concept of Nanoanalytics. There is however a need to explain in a clear way what Nanoanalytics does, what the outputs of Nanoanalytics are and what the terminology means.
- A concept and definition of Nanoanalytics.
−The most important types and classifications of nanotechnologies used in the chemical analysis.
- The scope of applications of Nanoanalytics in Chemical Analysis.

Activities and Outputs in 2018-2019 (e.g. reports, publications, seminars, meetings):
1. Dykman L.A., **Khlebtsov N.G.** Methods for chemical synthesis of colloidal gold. *Rus. Chem. Rev.* 2019. 88, (3), 229- 247.
2. Khlebtsov B.N., Bratashov D.N., Byzova N.A., Dzantiev B.B., **Khlebtsov N.G.** *Nano Res.* 2019, 12: 413–420.
3. Khlebtsov B.N., Burov A.M., Pylaev T.E., **Khlebtsov N.G.** *Beilstein J. Nanotechnol.* 2019, 10, 794–803.
4 Kuznetsova O., Reshetnikova I., **Shtykov S.N.,** Karandashev V.K., Keppler B.K., Timerbaev A.R. A simple assay for probing transformations of superparamagnetic iron oxide nanoparticles in human serum. *Chem. Commun.* 2019, 55, 4270-4272. DOI: 10.1039/C9CC01642B
5. Smirnova T.D., **Shtykov S.N.,** Zhelobitskaya E.A. Energy transfer in liquid and solid nanoobjects: application in luminescent analysis. *Phys. Sci. Rev.* 2019. V. 4(3). DOI: https://doi.org/10.1515/psr-2018-9981
6. Bittar, D.B., Ribeiro, D.S.M., Pascoa, R.N.M.J., Soares, J.X., Rodrigues, S.S.M., Castro, R.C., Pezza, L., Pezza, H.R., **Santos, J.L.M**. Multiplexed analysis combining distinctly-sized CdTe-MPA quantum dots and chemometrics for multiple mutually interfering analyte determination. *Talanta*. 2017, 174, 572-580.
7. Piloto. A.M., Ribeiro, D.S.M., Rodrigues, S.S.M., Santos C., **Santos, J.L.M**., Sales, M.G.F. Plastic antibodies tailored on quantum dots for an optical detection of myoglobin down to the femtomolar range. *Scientific Reports*. 2018, 8, manuscript 4944.
8. **RI Stefan-van Staden**, A. Lungu - Moscalu, J.F. van Staden Nanostructured Materials Used for Pattern Recognition of Bisphenols in Waste Waters. *J Electrochem Soc*, 2019. 166(12), B903-B907.
9. Pogacean F., Coros M., Magerusan L., Mirel V., Gergely S., Katona G., **Stefan-van Staden RI.**, Pruneanu S. *Microchem J*, 147, 112-120, 2019.
10. **Shtykov SN.** Preparation of the chapter "Nanoanalytics" in the third volume of the textbook "Analytical Chemistry"(Moscow, in Russian with the intention of translating into English).
Conferences: 1. "Separation and Preconcentration in Analytical Chemistry and Radiochemistry" (Russia) Oct. 2018. Shtykov S.N. Plenary lecture: "Nanoobjects in separation and preconcentration". 2. V Intern. Conf. on Colloid Chemistry and Physicochemical Mechanics (Saint-Petersburg, Russia). Sept. 2018. Shtykov S.N. Key-not lecture: "Colloid magnetic core-shell nanoparticles: modification and application in chemical analysis"
 3. International Conference on Laser Applications in Life Sciences (Israel) Nov. 2018. Khlebtsov N.G., Khlebtsov B.N., Bratashov D.N. Invited lecture: "Plasmonic Gap-Enhanced Raman Tags: Fabrication, Properties, and Applications".

Activities planned for 2019-2020:
Continued preparation of papers and reviews on the use of nano-objects and nanotechnology in chemical analysis.
Continuation of consultations with colleagues working in the field of nanoanalytics on the formation of consensus on its subject.
Continuation of the discussion of the methods necessary for the analysis and characterization of nano-objects those are important for analysis.
Start preparing a training manual on the use of nano-objects and nanotechnology in chemical analysis.

Report submitted by: Sergei Shtykov

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