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Lab Activities for Introducing Nanoscience to Teachers and Students

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Abstract : Nanoscience has become one of the main science fields in the world; its importance is reflected in both society and industry; therefore, it is very important to intensify educational programs among teachers and students that aim to introduce "Nano Concepts" to them. Two different lab activities were developed for demonstrating the importance of nanoscale materials using unique points of view. In the first, electrical conductive films made of silver nanoparticles were fabricated. The silver nanoparticles were protected against aggregation using electrical conductive polypyrrole, which acts also as conductive bridge between them. The experiments show a simpler way for fabricating conductive thin film than the much more complicated and costly conventional method. In the second part, the participants could produce emulsions of liposome structures using Phosphatidylcholine as a surfactant, and following by minimizing the size of it from micro-scale to nanometer scale (400 nm), using simple apparatus called Mini-Extruder, in that way the participants could realize the change in solution transparency, and the effect of Tyndall when the size of the liposomes is reduced. Freshmen students from the Academic Arab College for Education in Haifa, Israel, who are studying to become science teachers, participated in this lab activity as part of the course "Chemistry in the Lab". These experiments are appropriate for teachers, high school and college students.

Keywords : case study, colloid, emulsion, liposome, surfactant
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