

ML 06

COLLOIDAL PARTICLES IN NANOBIOLOGICAL TECHNOLOGIES FOR BIOMEDICAL DIAGNOSTIC APPLICATIONS

H. Elaissari

Claude Bernard University, LAGEP Laboratory, Bât. CPE-308G

43 Bd. 11 Nov. 1918, 69622 Villeurbanne Cedex, France

elaissari@lagep.univ-lyon1.fr

<http://www-lagep.univ-lyon1.fr>

Before the investigation of any target application, the colloidal particles should answer various questions levels starting basically from particle size, size distribution, surface polarity and also intrinsic properties. Consequently, the synthesis process should be well adapted in order to prepare structured particles latex particles bearing shell with well-defined properties.

The colloidal particles are not only under evaluated in various biomedical applications, but they are really used in various biomedical levels: (i) They are used in rapid diagnostic tests based on agglutination process. (ii) Cationic particles (i.e magnetic latexes) are principally used in nucleic acids extraction and concentration. (iii) Cell sorting and identification using magnetic or fluorescent particles, (iv) Viruses extraction and detection via hydrophilic and charged magnetic particles. (V) General particles (mainly carboxylic in surface) are used in immunoassays and specific capture of single stranded DNA fragments.

The specificity and the sensitivity of the targeted application efficiency are directly related to the surface particles properties and to the accessibility of the immobilized biomolecules. The interactions between biomolecules and reactive particles are strongly dependent on the colloidal and surface properties of the dispersion, and the physico-chemical properties of the biomolecules. In this direction, considerable attention has been paid to the preparation of magnetic latex particles for biomedical applications. Indeed, these composites particles are commonly used in immunoassays as solid phase supports for the immobilization of biomolecules such as oligonucleotides, proteins or antibodies. The main advantage of colloidal magnetic particles in nanobiotechnologies is due to their separation upon applying an external magnetic field.