

1. Nucleic acid / cationic amphiphile material [PDF-1]

Nucleic acids are the good example of the supra-molecular materials to create complex supra-molecular structures that are well-known as a source of biological information depending on their base sequences. Deoxyribonucleic acid (DNA) and ribonucleic acid (RNA) represent the interesting biomaterials because of their rod-like structure that come from the helical structure built of electron-conductive base-pair stacking. In this study, nucleic acid / cationic amphiphile materials are prepared by exchanging the counter-ions of the phosphate moieties with cationic amphiphile. Different types of cationic amphiphile are utilized to form these materials. The obtained nucleic acid / amphiphile complexes are soluble in organic solvents and form transparent films by casting from organic solution. Thus, DNA / amphiphile film properties will be compared with those of the RNA / amphiphile films. The challenge of RNA is also related to the free 2'-OH group. The chemical modification of the RNA backbone can be constructed the intermolecular (non-covalent) bonding to perform with various biological groups such as peptide amphiphile, crosslinking agent, hydrogen bonding substance, etc. Bio-interaction between nucleic acid and cationic amphiphile is investigated to better understand these novel bioinspired materials.

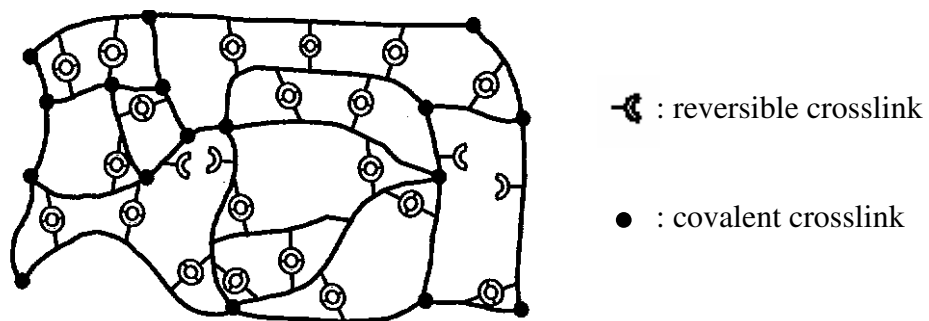


Figure. General strategy for the formation of crosslinked gels and thin films bases on covalent and reversible bonding.