

Nucleic Acid Separation Process with Silica Coated Magnetic Nanoparticles

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This work describes the development of high throughput nucleic acid separation process using the amino-functionallized silica coated magnetic nanoparticles. The magnetic nanoparticles were synthesized and coated by silica in controlling the coating thickness and sizes. The surface modification was performed with amino-functionallized organic silanes on silica coated magnetic nanoparticles. The spectroscopic tools such as a FT-IR(ATR-method), DRIFT-UV/Vis., and XRD were used to characterization and the Vibrational Sample Magnetometer (VSM) was also used to measure the magnetic strength. To elucidate the relationship between surface area and reactivity of the materials, BET and Zetapotential were used. The target nucleic acid was extracted from human blood and used through the conventional cell lysis. The use of functionalized self-assembled magnetic nanoparticle for nucleic acid separation process give a lot of advantages rather than use of conventional silica based materials.