Preparation and Characterization of Janus Silica Particles by using Trapping Layer

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Abstract

Janus particles which consist of two or more phase are the fascinating concept [1-2]. The Janus concept is the fascinating and promising technique on the nano-materials. This concept can be applied in many fields, suich as colloidal materials, nanocomposites, and supporting material of catalysis, drugs, and biomaterials. [3-4]

In this research, Janus silica particles were prepared with the silane modifying compounds by using two types of trapping layer. The trapping layer was spread on the substrate by spin coating of PS/toluene solution on the Si wafer and the electrostatic attraction self-assembly between PDDA and glass plate. After the trapping layer, silica particles were arrayed on the trapping layer by spin coating on the PS layer and electrostatic self-assembly between PDDA layer and silica particles. The silica particle/trapping layer/substrate was thermally treated during the 5 min, and then the silica particles were trapped in the trapping layer. The silane compound was introduced on the untrapped surface by the sol-gel method. After surface modification reaction, the substrate was washed by DI water and dried in the convection oven during the 24 hr. The characterization of silica/trapping layer/substrate was performed by XPS, SEM, and IR analysis.

References

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Figures

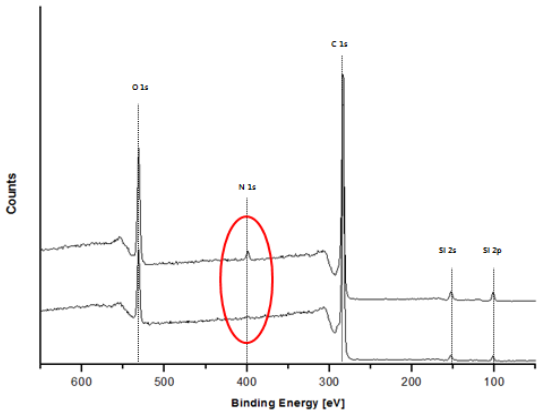

Fig. 1 XPS spectrum of silica/PS/wafer before and after modification

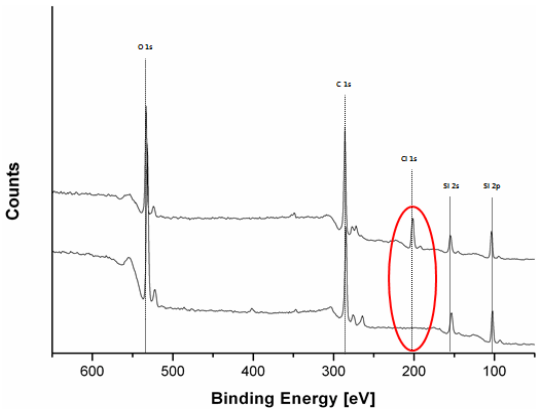

Fig. 2 XPS spectrum of silica/PDDA/glass before and after modification