

RICE STARCH-TEMPLATED SYNTHESIS OF NANOSTRUCTURED SILICA AND HEMATITE

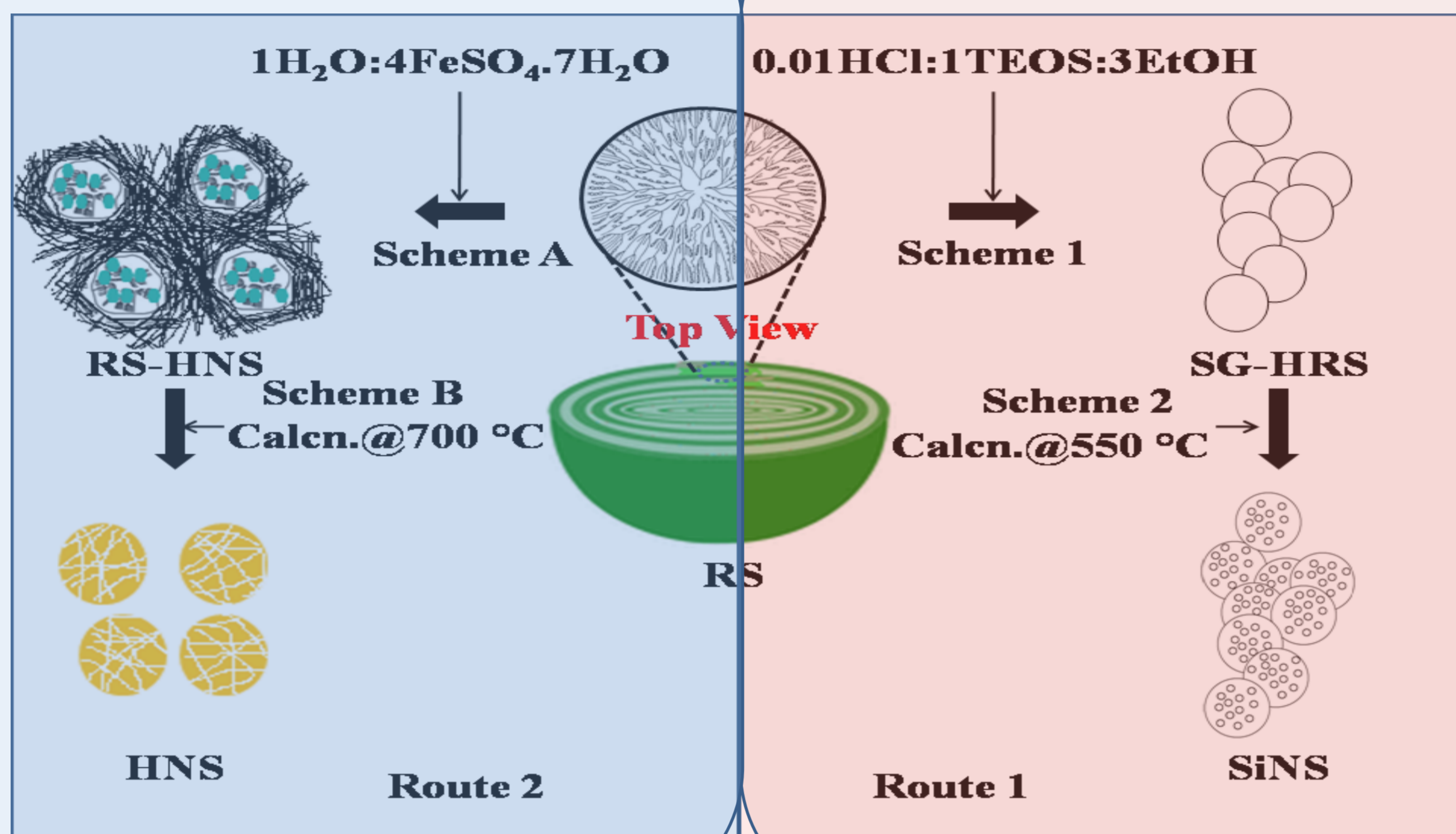
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HIGHLIGHT

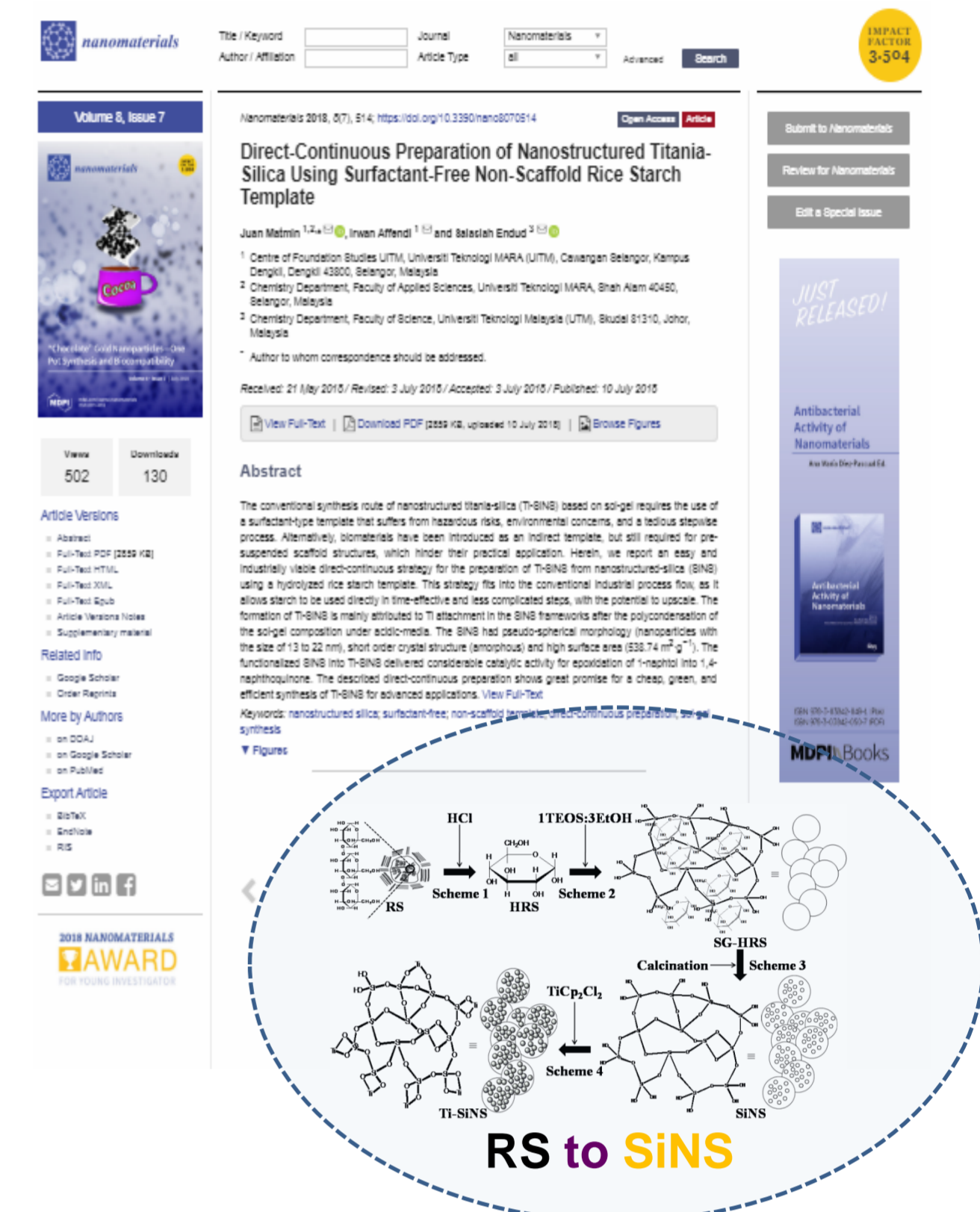
A New Successful Templated Synthesis of Nanostructured Silica (SiNS) and Hematite (HNS) Using Rice Starch (RS)



Direct-Continuous Preparation

J. Matmin, *Nanomaterials*.

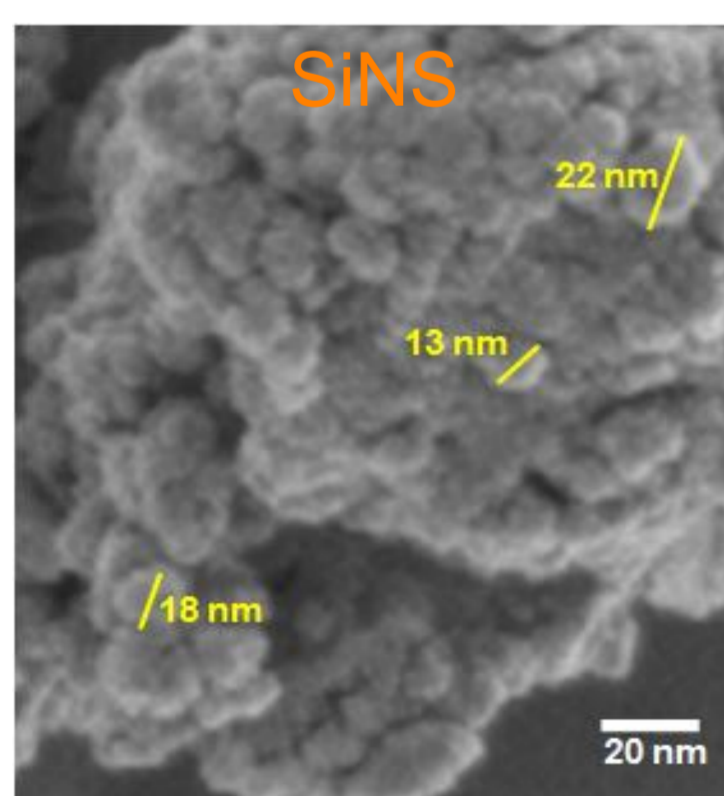
2018, 8, 514 (IF= 3.504)



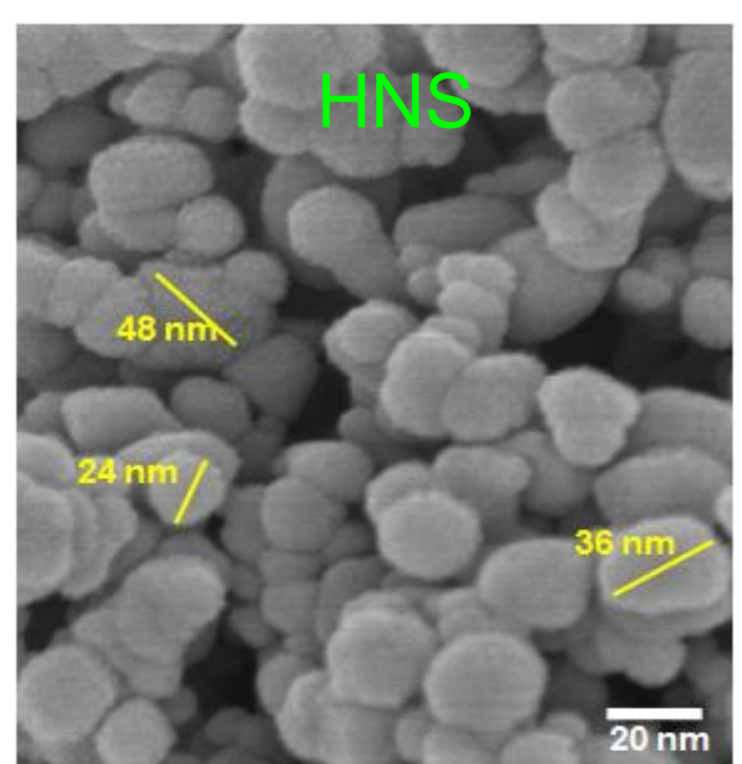
Synthesis of nanostructured (NS) materials is not straightforward which involve the complicated use of surfactant templates. Currently, only non-renewable resources that are hazardous and toxic are used to produce the surfactant templates in the industries. This study presents an environmentally friendly and efficient route for the synthesis of nanostructured of both silica and hematite using rice starch as a promising biomaterials template. The rice starch-templated synthesis yield both hematite and silica with nano-sized and high surface area. In particular, the nanostructured silica (SiNS) showed a pseudo-spherical morphology with nano-sized from 13 to 22 nm, amorphous structure and surface area of 538.74 m²/g. On the other hand, the nanostructured hematite (HNS) showed an spherical-shaped morphology with nano-sized from 24 to 48 nm, rhombohedral structure, and surface area of 20.04 m²/g. Interestingly, both synthesized silica and hematite showed capability as good nano-catalysts.

CHARACTERIZATION

FESEM Micrograph

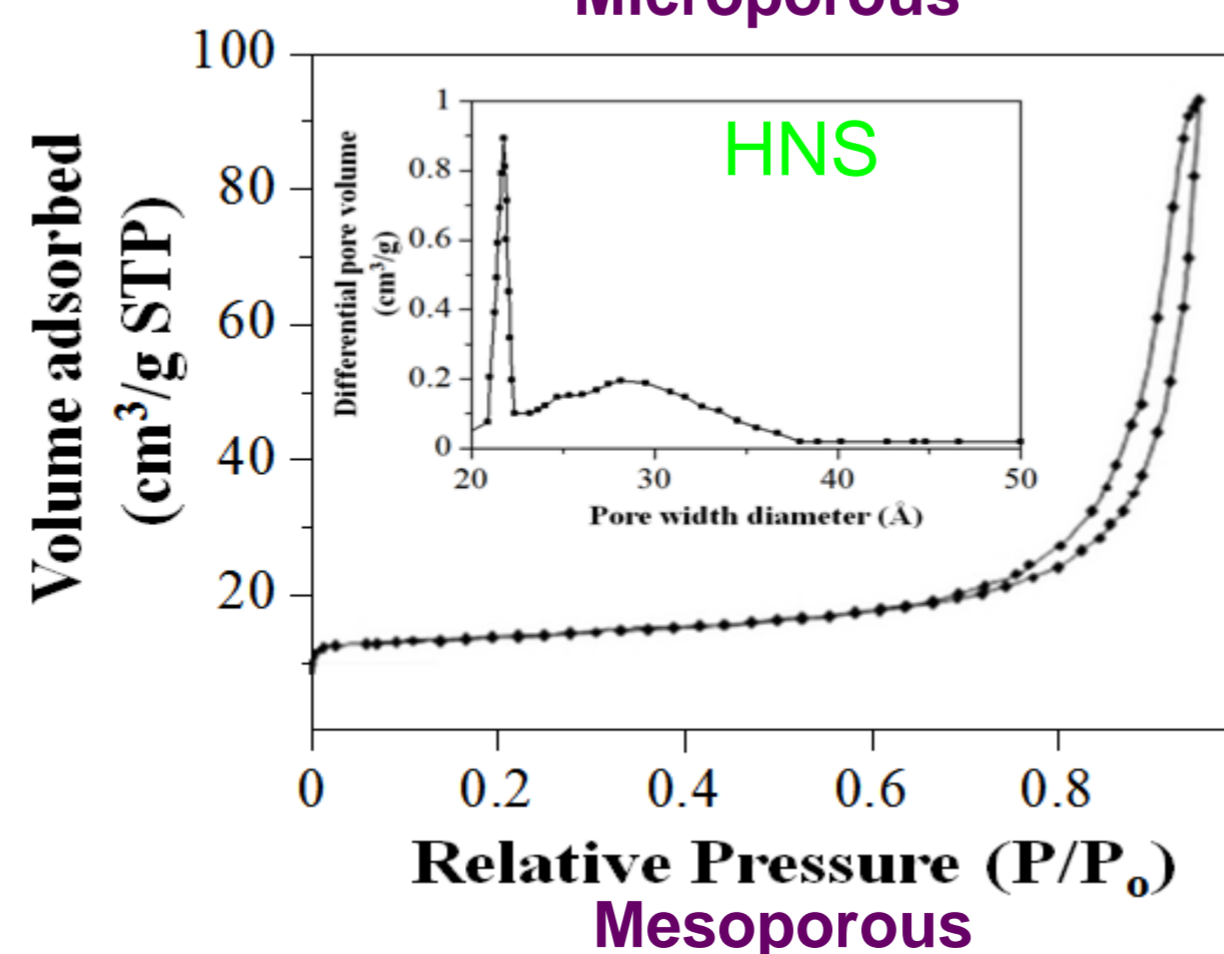
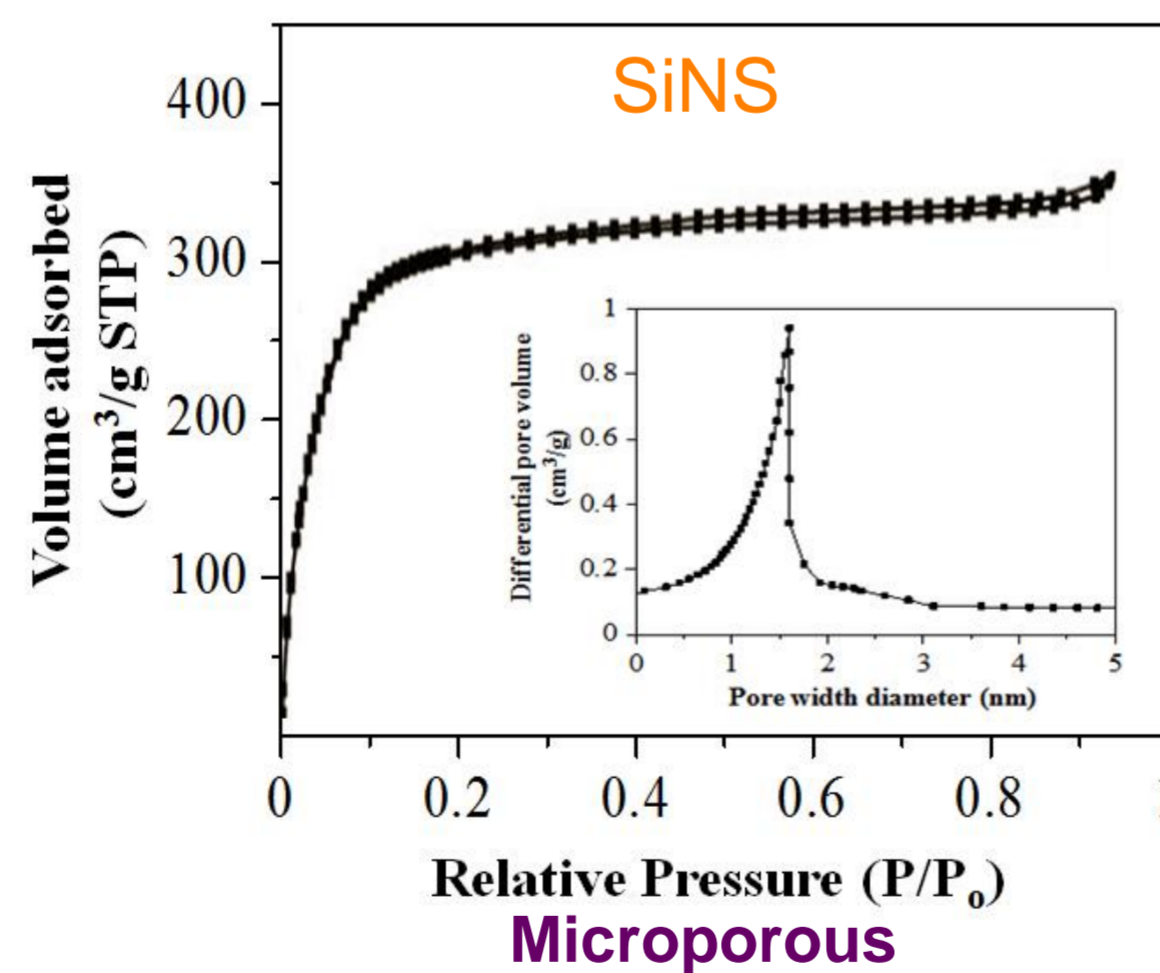


Loose pseudo-sphere



Ordered spherical

Physisorption Measurements



Sample	Surface area (m ² /g)	Pore diameter (nm)
SiNS	538.74	1.6
HNS	20.04	2.2

Conclusion

The used of rice starch-template for a greener approach in the synthesis of nanostructured of Silica and Hematite have been successfully outlined.

ACKNOWLEDGEMENT

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