

## Electronic Supplementary Material

### Directed assembly of nanoparticles to isolated diatom valves using the non-wetting characteristics after pyrolysis

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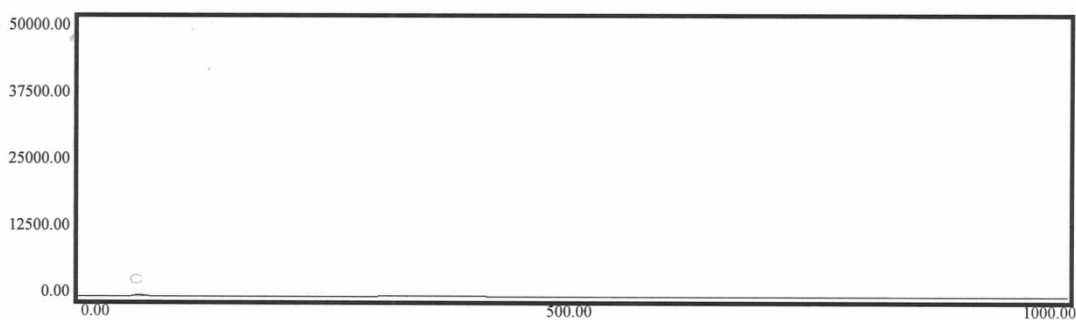
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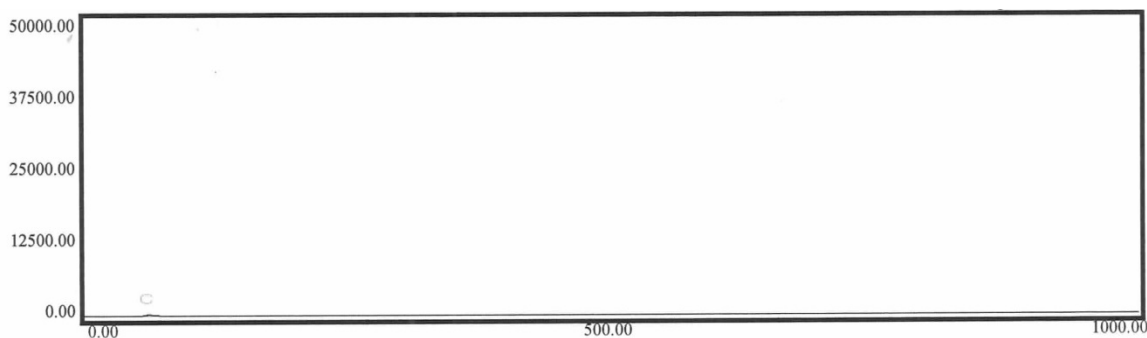
#### S1 ELEMENTAL ANALYSIS

H<sub>2</sub>O<sub>2</sub> treated biosilica



<u>Name</u>	<u>Rt</u>	<u>Area/1000</u>	<u>Area%</u>	<u>Height/1000</u>	<u>Start</u>	<u>End</u>	<u>Percentage</u>
Carbon	65	3.212	100.000	0.884	20	99	0.901
Carbon	64	2.825	100.000	0.835	19	104	0.909

Biosilica after pyrolysis



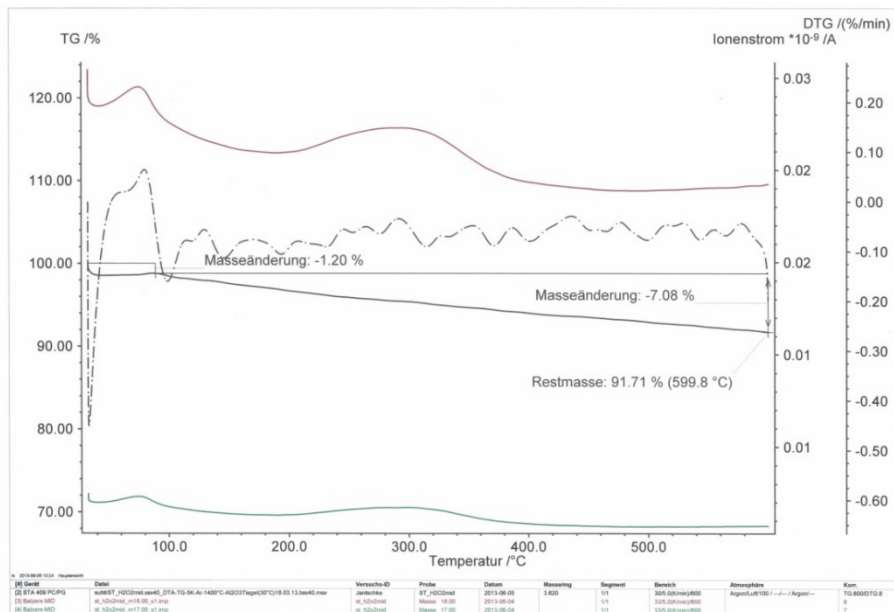
<u>Name</u>	<u>Rt</u>	<u>Area/1000</u>	<u>Area%</u>	<u>Height/1000</u>	<u>Start</u>	<u>End</u>	<u>Percentage</u>
Carbon	65	2.369	100.000	0.787	20	98	0.771
Carbon	65	2.300	100.000	0.754	17	101	0.755

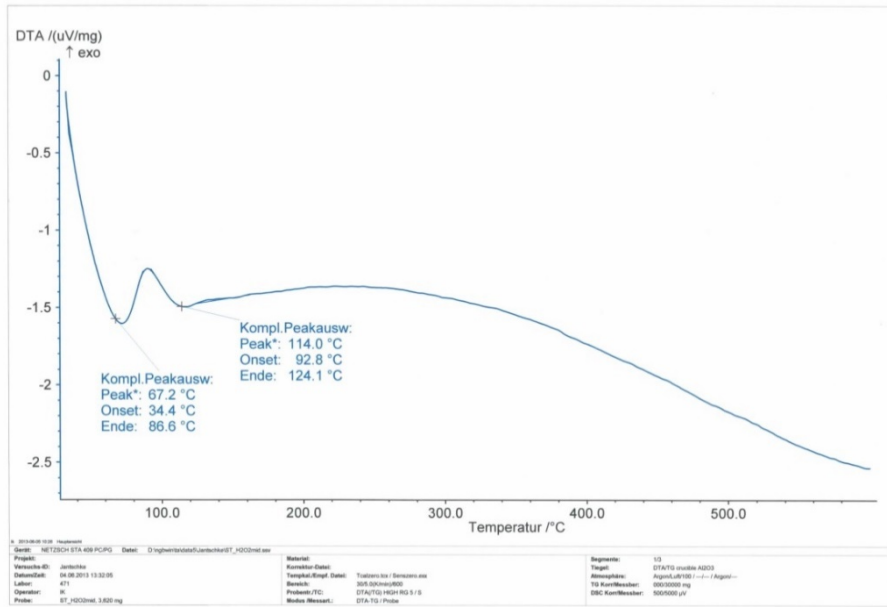
## S2 BET MEASUREMENTS

	Surface area [m <sup>2</sup> /g]	Pore volume [cm <sup>3</sup> /g]
S. turrus SDS/EDTA + H <sub>2</sub> O <sub>2</sub>	51	0,125
S. turrus SDS/EDTA + H <sub>2</sub> O <sub>2</sub> + pyrolysis (500 °C)	30	0,091
S. turrus SDS/EDTA + H <sub>2</sub> O <sub>2</sub> + pyrolysis (750 °C)	26	0,094

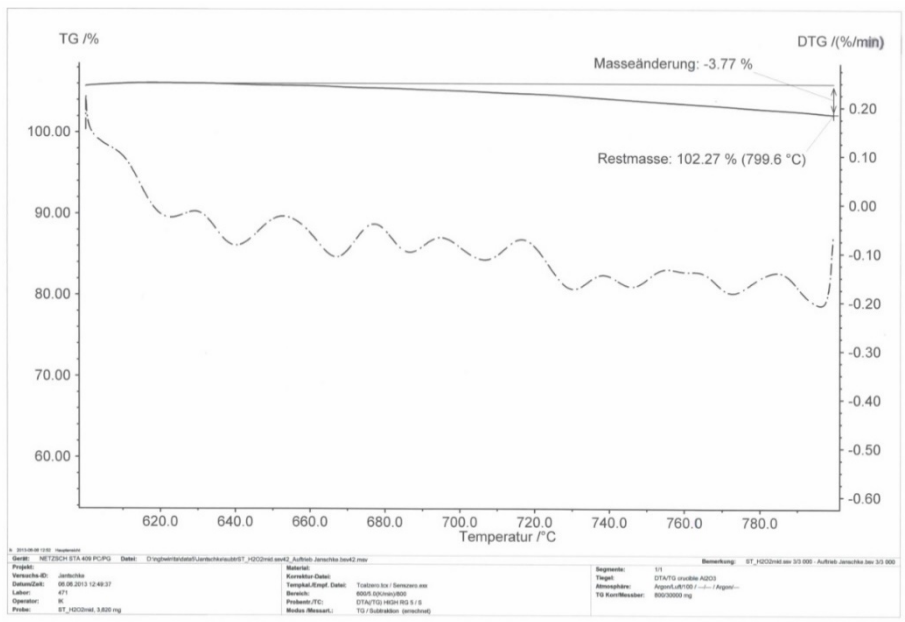
## S3 TG/DTG AND DTA MEASUREMENTS

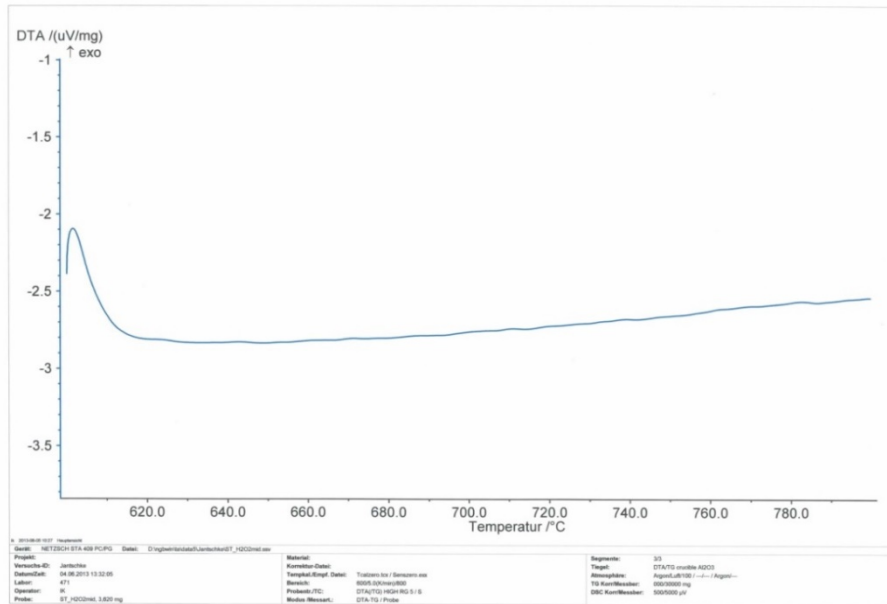
Stage (i)

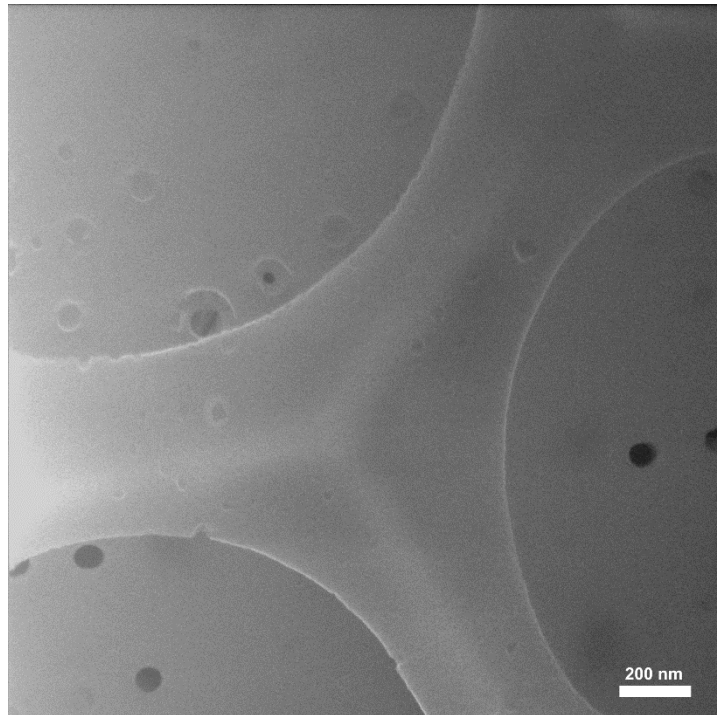




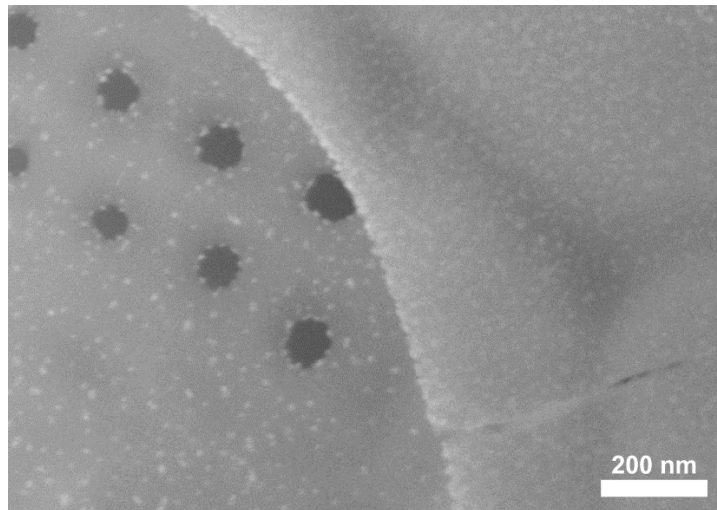
Stage (ii):







**Figure S4.1** HIM image of *S. turris* biosilica without attached nanoparticles (reference).



**Figure S4.2** HIM image of *S. turris* biosilica with a mechanical crack results in a less selective NP coupling. The coupling solution penetrates into the areolae.