

## Supplementary Material

### Surface properties of 1D TiO<sub>2</sub> microrods modified with copper (Cu) and nanocavities

#### 1. Thermal analysis and mass spectra

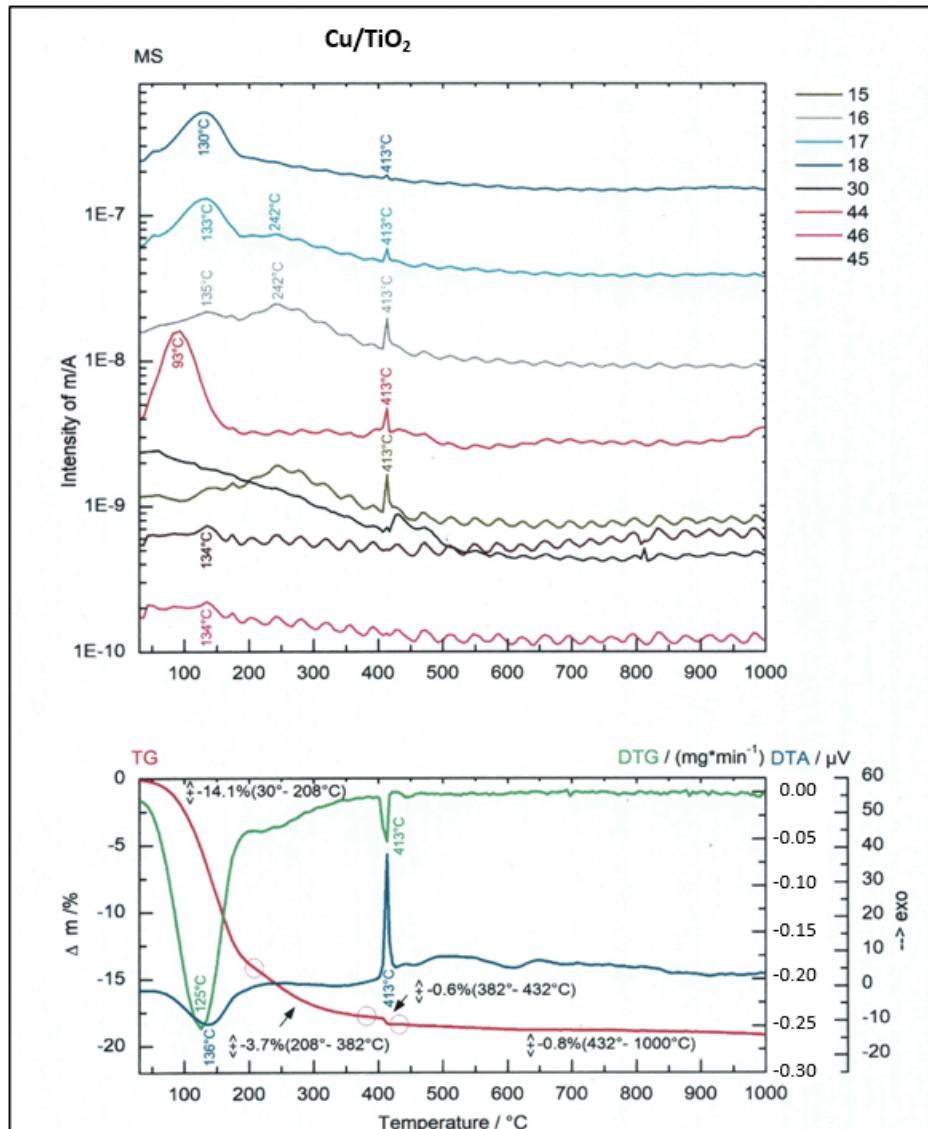


Figure S1 Results of thermal and MS analysis

Figure S1 captures the results of the thermal analysis of a Cu /TiO<sub>2</sub>\_N sample (simultaneous TG/DTA curves). The DTA curve shows the minimum at 136 ° C belonging to the endothermic reaction (water release) and the maximum at 413 ° C belonging to the exothermic reaction (adsorbed OH groups on the surface). It can be

seen from the TG curve that the weight loss after heating is approximately 19%. This is due to the release of gaseous species of H<sub>2</sub>O with evolution curves 18, 17, 16. In the second and third steps, the escape of CO<sub>2</sub> (evolution curves 44,16,45,46), NH<sub>3</sub> (evolution curves 16,17,15), N<sub>2</sub>O (evolution curves 44, 30, 16), NO (15), and SO<sub>2</sub>/SO (evolution curves 48/64) from the Cu /TiO<sub>2</sub>\_N sample were observed [1]. The sample mass spectra (MS) with lines indicated the peaks of each species by using the NIST Mass Spectral Search Program (Software version 2.2) [2] are presented in Figures S2-S10.

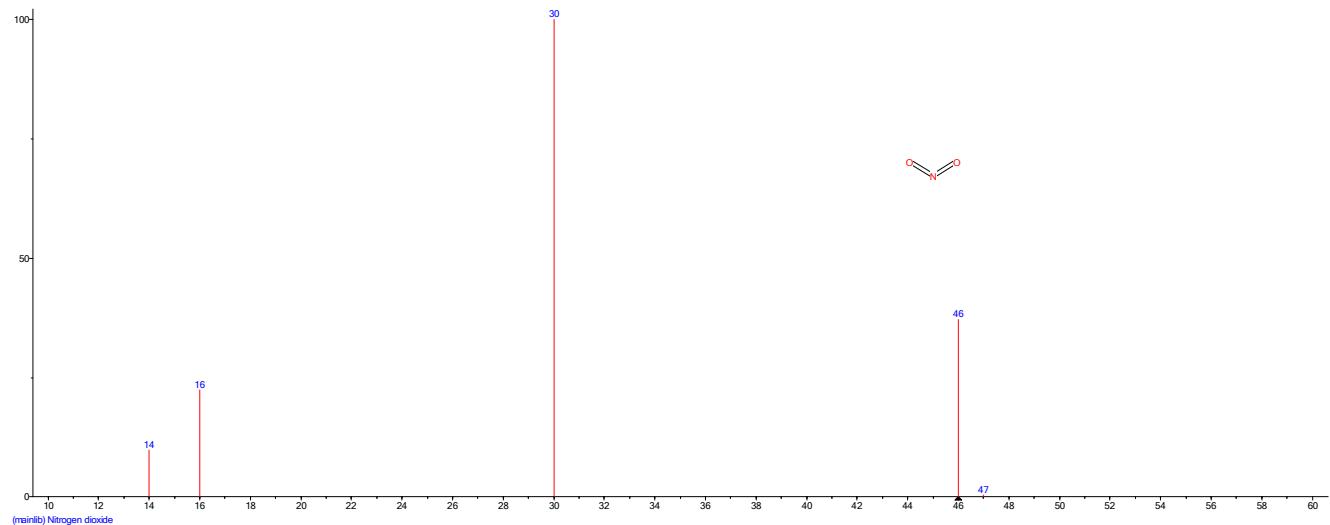


Figure S2. Evolution of gas fragments of NO<sub>2</sub>

5 largest peaks:

30 999 | 46 370 | 16 223 | 14 96 | 47 1 |

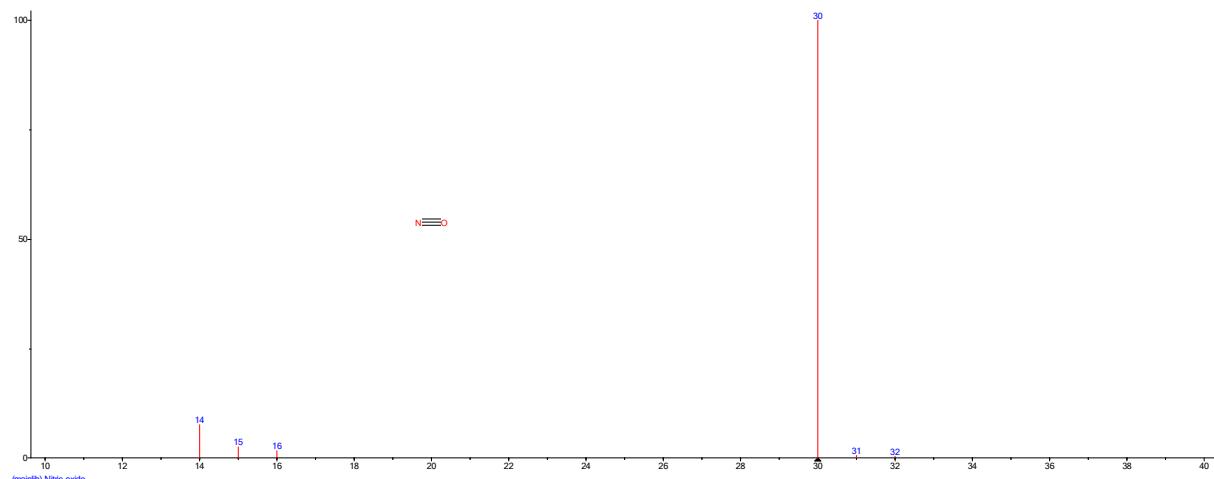


Figure S3. Evolution of gas fragments of NO

6 largest peaks:

30 999 | 14 75 | 15 24 | 16 15 | 31 4 | 32 2 |

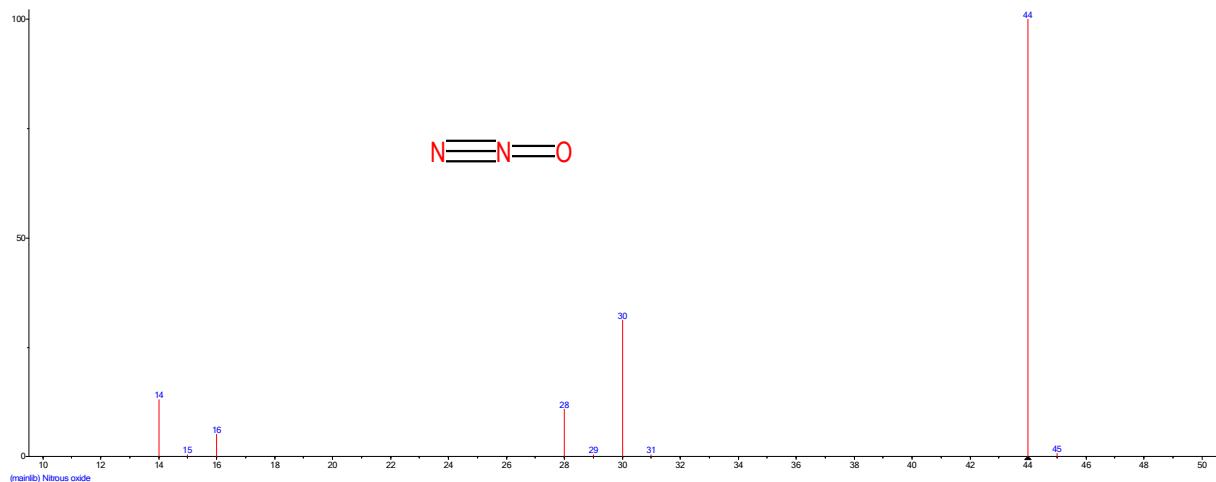


Figure S4. Evolution of gas fragments of N<sub>2</sub>O

9 largest peaks:

44 999 | 30 311 | 14 129 | 28 108 | 16 50 |  
45 7 | 15 1 | 29 1 | 31 1 |

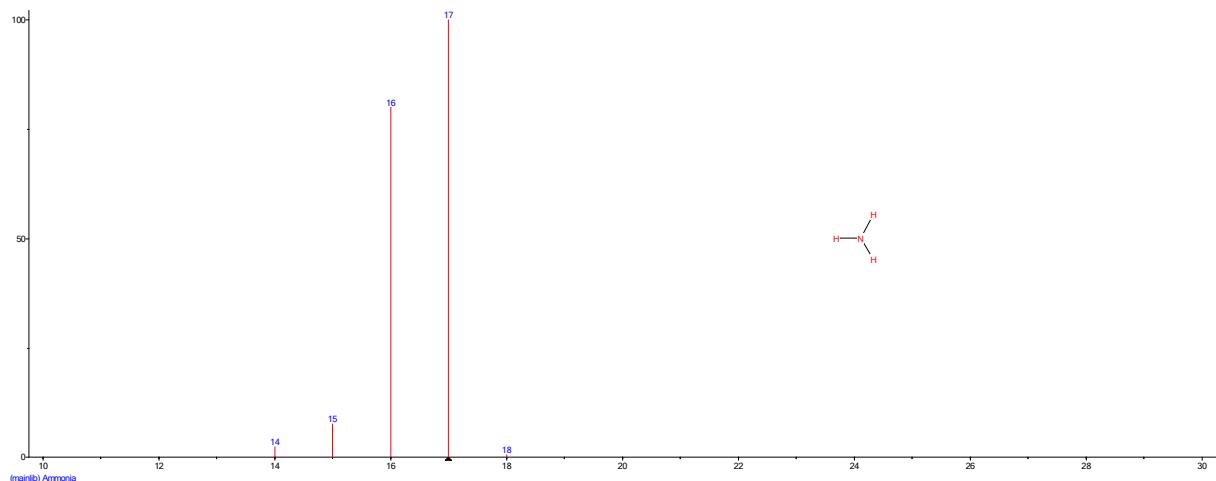


Figure S5. Evolution of gas fragments of NH<sub>3</sub>

5 largest peaks:

17 999 | 16 800 | 15 75 | 14 22 | 18 4 |

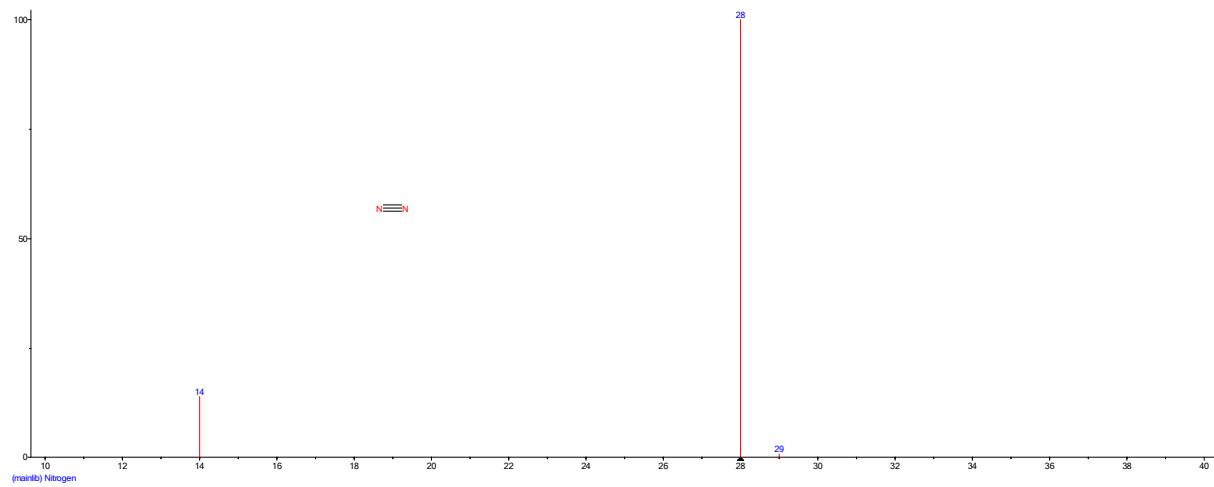


Figure S6. Evolution of gas fragments of  $\text{N}_2$

3 largest peaks:  
 $28\ 999$  |  $14\ 137$  |  $29\ 7$  |

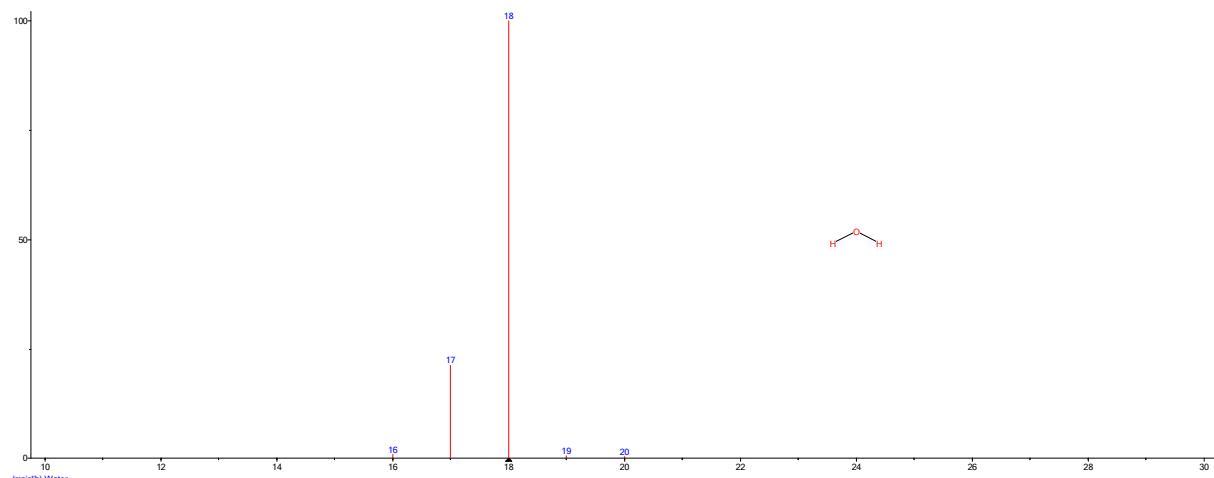


Figure S7. Evolution of gas fragments of  $\text{H}_2\text{O}$

5 largest peaks:  
 $18\ 999$  |  $17\ 212$  |  $16\ 9$  |  $19\ 5$  |  $20\ 3$  |

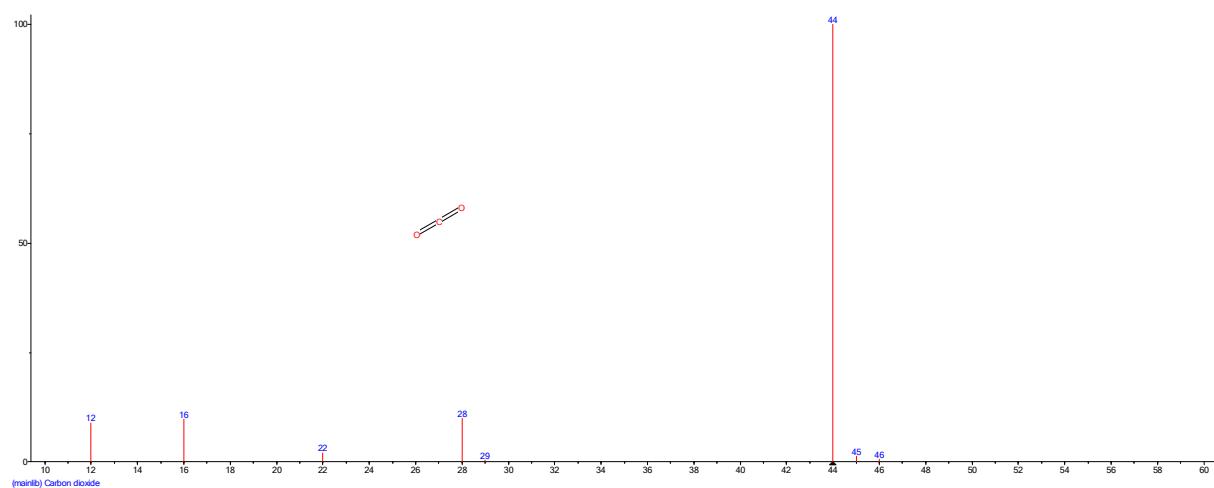


Figure S8. Evolution of gas fragments of CO<sub>2</sub>

8 largest peaks:

44 999 | 28 98 | 16 96 | 12 87 | 22 19 |  
45 12 | 46 4 | 29 1 |

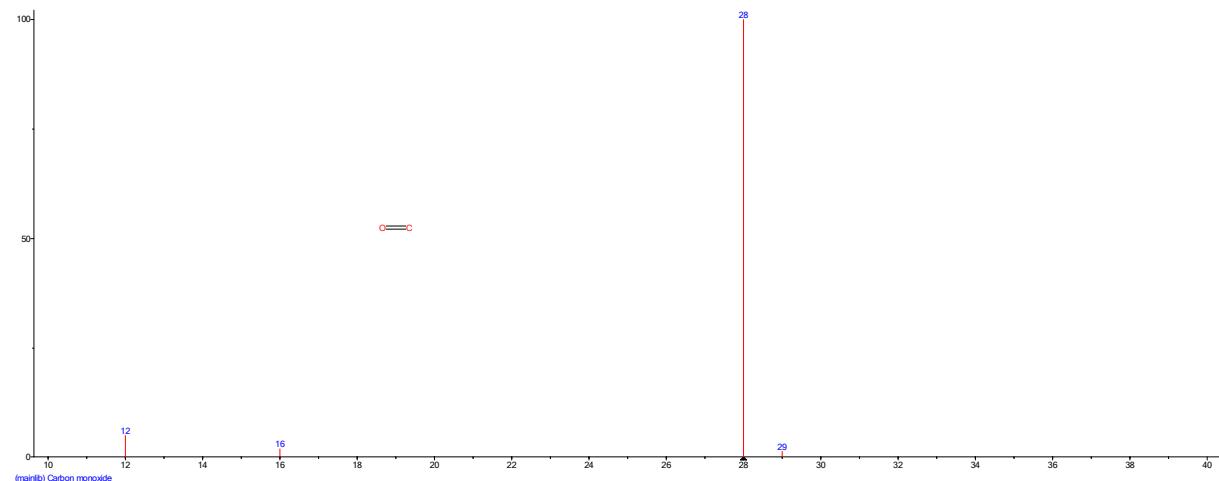


Figure S9. Evolution of gas fragments of CO

4 largest peaks:

28 999 | 12 47 | 16 17 | 29 12 |

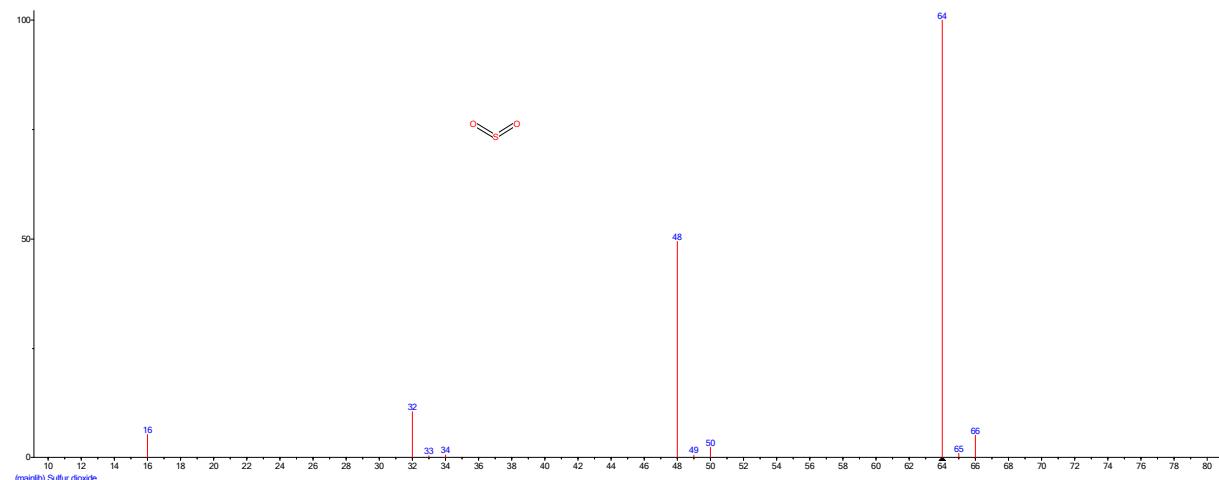


Figure S10. Evolution of gas fragments of SO<sub>2</sub>

10 largest peaks:

64 999 | 48 493 | 32 104 | 16 52 | 66 49 |  
50 23 | 65 9 | 34 4 | 49 4 | 33 1 |

## REFERENCES

[1] Madarász, J., Varga, P., Pokol, G., Evolved gas analyses (TG/DTA–MS and TG–FTIR) on dehydration and pyrolysis of magnesium nitrate hexahydrate in air and nitrogen, *J Anal and Applied Pyrolysis*, 2007, 79, 475–478.

[2] Stein, S., Mrokhin, Y., Tchekhovkoi, D., Mallard, W., NIST/EPA/NIH Mass Spectral Library with NIST Mass Spectral Search Program (Software version 2.2) 2014, NIST, the U.S. Secretary of Commerce.