Electronic Supplementary Material (ESI) for RSC Advances.
This journal is © The Royal Society of Chemistry 2016

Supporting information (SI)

TiO_2 sol-embedded in electroless Ni-P coating: A novel approach for ultra-sensitive sorbitol sensor

Pranee Rattanawaleedirojn[a,*], Kanokwan Saengkiettiyut[a],

Yuttanant Boonyongmaneerat[a], Supin Sangsuk[b], Nadtinan Promphet[c],

Nadnudda Rodthongkum[a]

[a]*Metallurgy and Materials Science Research Institute, Chulalongkorn University, Soi Chula 12, Phayathai Road, Pathumwan, Bangkok 10330 Thailand*

[b]*School of Agricultural Resources, Chulalongkorn University, Soi Chula 64, Phayathai Road, Pathumwan, Bangkok 10330 Thailand*

[c]*Nanoscience and Technology Program, Graduate School, Chulalongkorn University, Bangkok 10330, Thailand*

**Corresponding author e-mail: pranee.r@chula.ac.th (Rattanawaleedirojn, P.)*

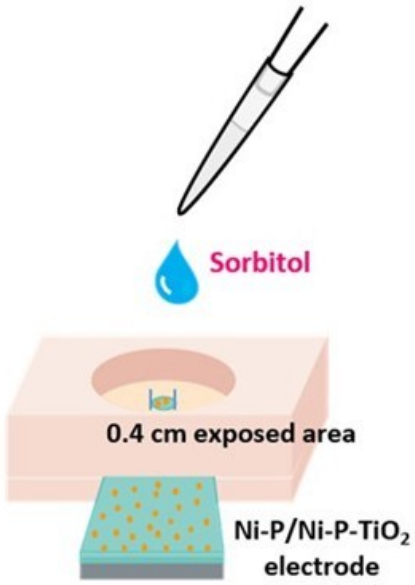


Fig. S1 The configuration of an electrochemical cell used in this work.

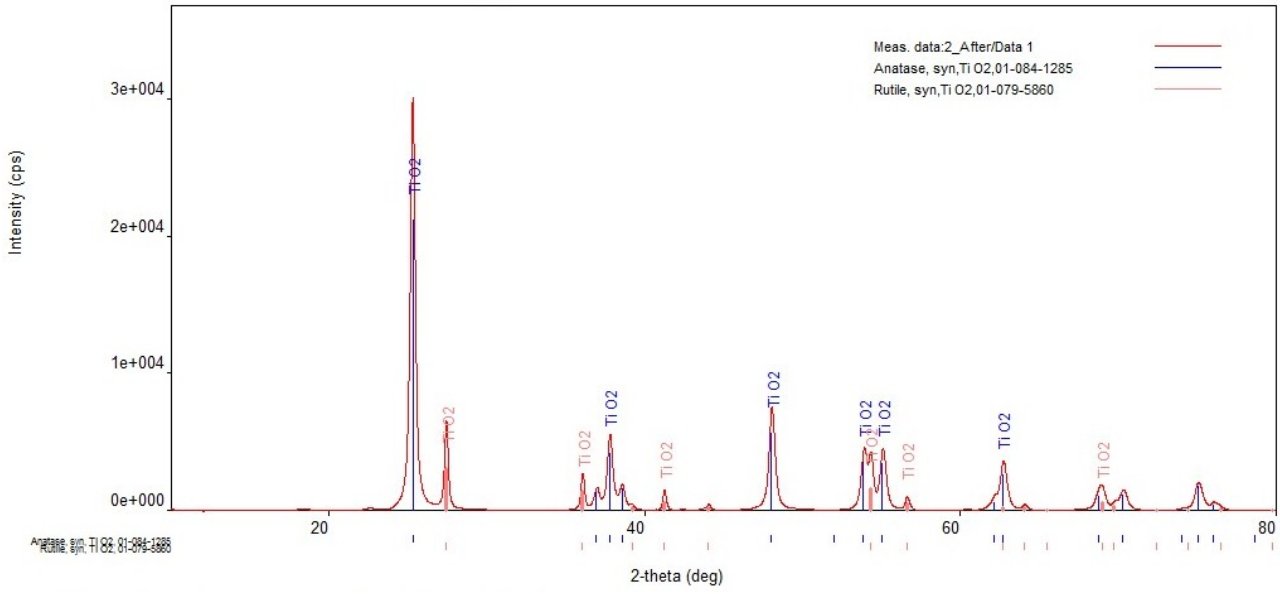
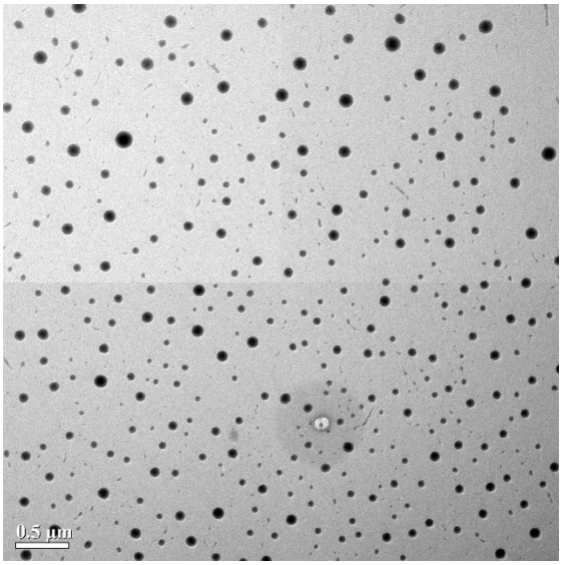


Fig. S2 An XRD spectrum of white TiO_2 powder after calcination at 600 °C for 1 hour (Rigaku, SmartLab, scan rate 10-80 degree, speed 1 degree/min, step 0.01 degree).



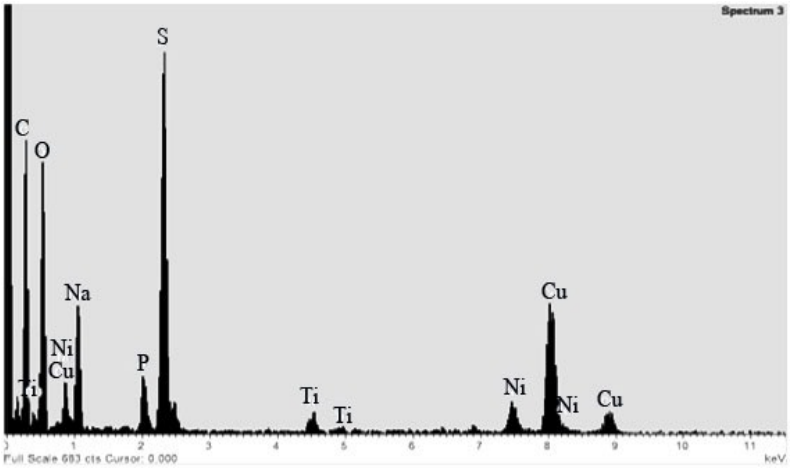
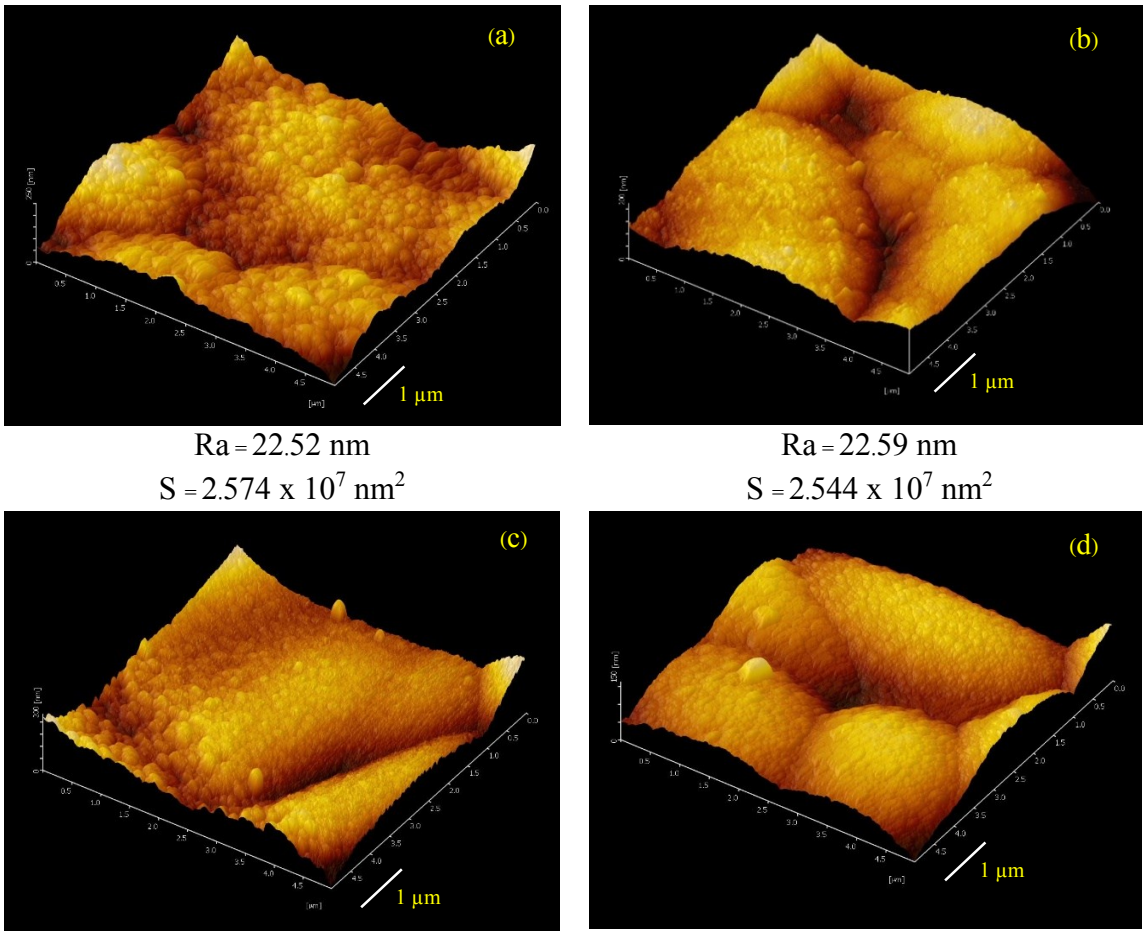


Fig. S3 SEM images of TiO_2 sol in Ni-P electroless bath.



Ra = 22.52 nm
S = 2.574 x 10^7 nm^2

Ra = 22.59 nm
S = 2.544 x 10^7 nm^2

Ra = 19.02 nm
S = 2.646 x 10^7 nm^2

Ra = 19.96 nm
S = 2.522 x 10^7 nm^2

Fig. S4 AFM images indicating the surface area (S) of (a) Ni-P-TiO_2 (2 g/L of TiO_2) coating, (b) Ni-P/Ni-P (0 g/L of TiO_2) coating, (c) Ni-P/Ni-P-TiO_2 (2 g/L of TiO_2) coating and (d) Ni-P/Ni-P-TiO_2 (4 g/L of TiO_2) coating. (SPA-400 atomic force microscope (Seiko Instruments, Inc., Japan), using non-contact mode).

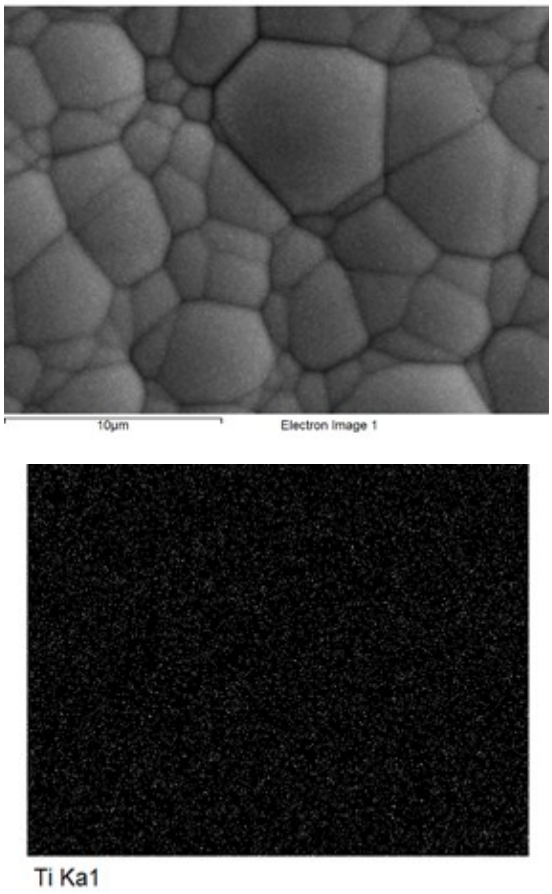


Fig. S5 An SEM image of Ni-P-TiO_2 (top) and the surface mapping indicates the distribution of Ti on the coated surface (bottom).

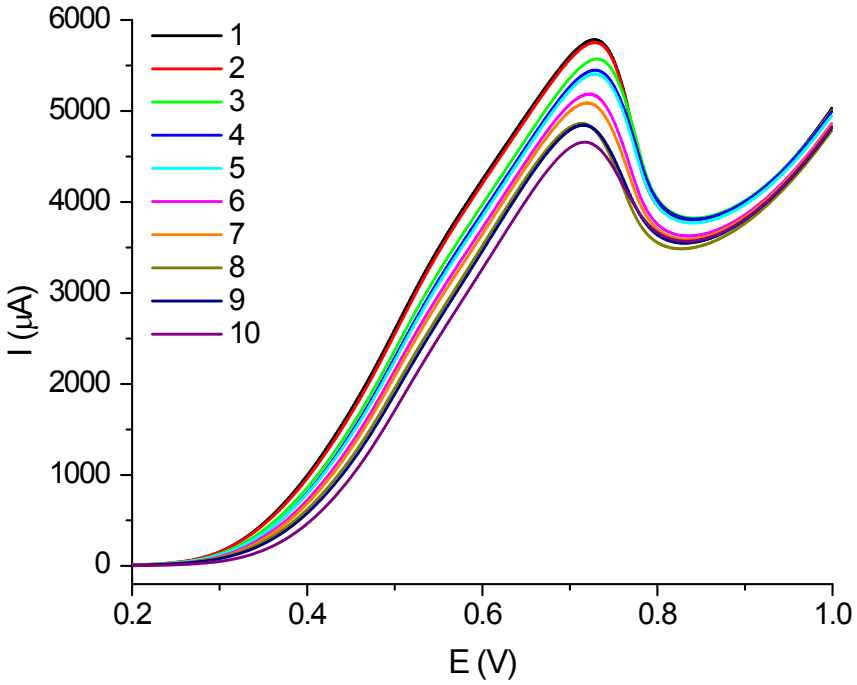


Fig. S6 Reproducibility of Ni-P/Ni-P-TiO_2 electrode for 10 consecutive detection of sorbitol.

Table S1 Stability of electrode for the detection of different compounds after storage for 7 days.

Electrode	**% of current signal compared to an original current signal**				
	Methanol	**Ethanol**	**Isopropanol**	**Sorbitol**	**Glucose**
Ni-P	85.1 ± 13	84.4 ± 25	83.0 ± 11	85.0 ± 16	83.2 ± 12
Ni-P-TiO_2 (2 g/L of TiO_2)	89.0 ± 3.9	90.1 ± 2.6	89.0 ± 3.5	91.0 ± 4.1	83.3 ± 1.9
Ni-P/Ni-P-TiO_2 (2 g/L of TiO_2)	91.5 ±1.4	93.7 ± 1.2	93.6 ± 1.6	96.4 ± 1.1	89.5 ±3.4