

## Electronic Supplementary Information

Table S1 pH jumps for different concentrations of o-NBA-PEG irradiated by 20 mW/cm<sup>2</sup> UV light for 5min.

| <i>Concentration of o-NBA-PEG (%)</i> | <i>Status of solution</i> | <i>pH before UV radiation (a)</i> | <i>pH after 5min UV radiation (b)</i> | <i>pH jump ((a)-(b))</i> |
|---------------------------------------|---------------------------|-----------------------------------|---------------------------------------|--------------------------|
| <b>1%</b>                             | Complete Dissolution      | 7.07                              | 3.65                                  | 3.42                     |
| <b>3%</b>                             | Complete Dissolution      | 7.11                              | 3.02                                  | 4.09                     |
| <b>5%</b>                             | Complete Dissolution      | 7.08                              | 2.68                                  | 4.40                     |
| <b>7%</b>                             | Precipitation             | 7.09                              | 2.74                                  | 4.35                     |
| <b>10%</b>                            | Precipitation             | 7.06                              | 2.65                                  | 4.41                     |

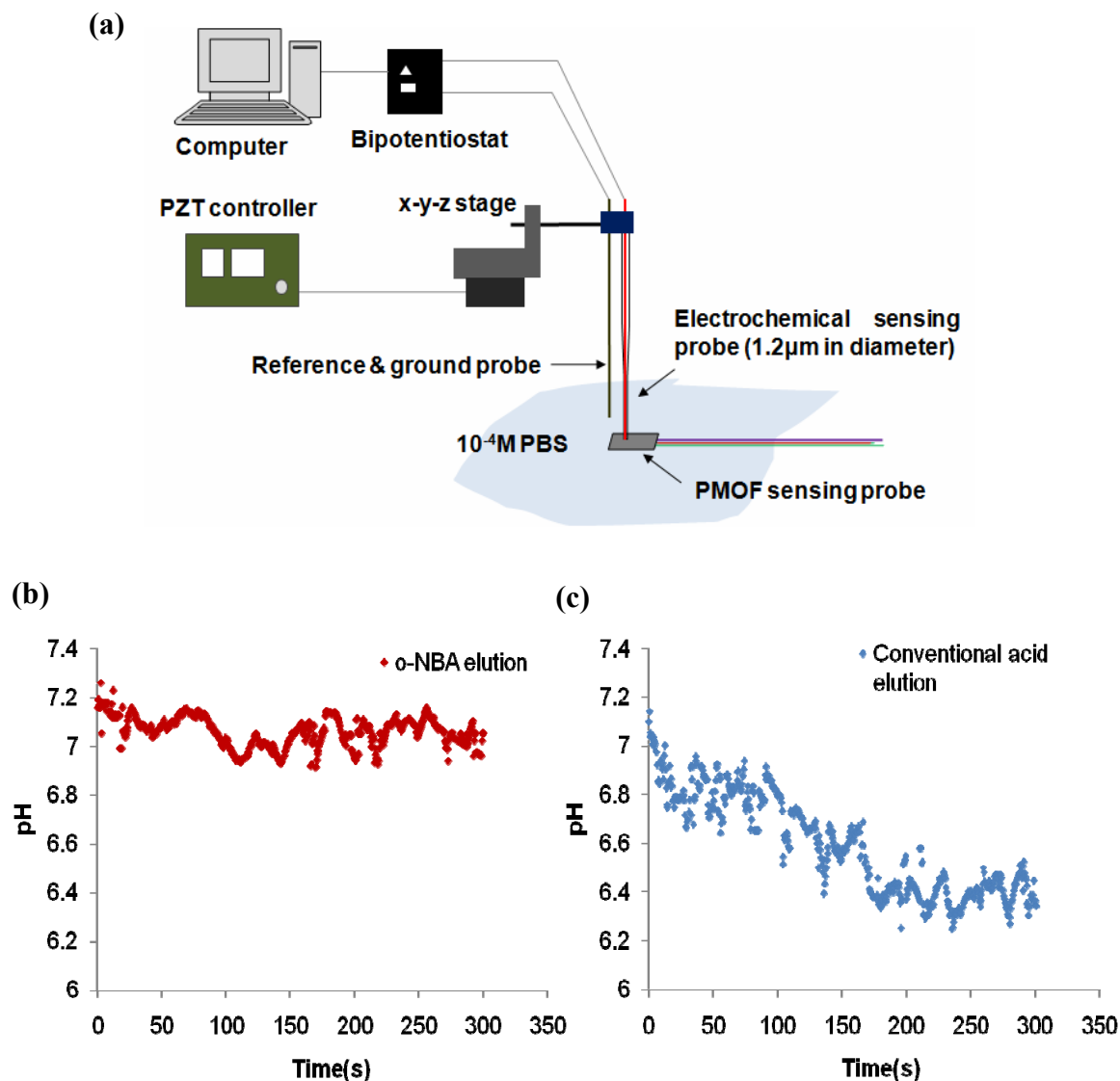


Fig. S1 (a) Schematic diagram of the local pH measurement setup by using a micro electrochemical probe. A scanning electrochemical microscopy system is comprised of three electrodes and a potentiometer (Bipotentiostat/galvanostat, CHI 760b electrochemical analyzer, Austin, TX). The three electrode setup includes a potentiometric tip (1.2  $\mu\text{m}$  probe tip) for pH detection, an Ag/AgCl pseudoreference electrode, and a Pt wire connected to ground. The output electrochemical signal is analyzed by the potentiometer and shown on the computer. A PZT-driving XYZ stage (E-621 Piezo Servo-Controller & Driver, PI, Germany) is used to control the electrochemical sensing probe to locate at the place with 1.5 mm distance to the FOI sensor tip. Fig. S1 (b) and (c) show the results of local pH monitoring for the o-NBA elution and conventional acid elution methods (steady flow of pH 2.7 acid buffer at 1  $\mu\text{L}/\text{min}$ ), respectively.