Supporting Information

for

A simple and sensitive spectrofluorimetric method for the determination of sodium hexametaphosphate based on Tb(III)-TATAB complex

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Materials

The ligand 4, 4' ,4" - (1, 3, 5-triazine-2, 4, 6-triyl)-tris (azanediyl))-tribenzoic acid (H_3TATAB) (97%) was purchased from Shanghai naqian. Terbium(III) nitrate pentahydrate was commercially obtained from *Aladdin*. $(NaPO_3)_6$, $CuSO_4 \cdot 5H_2O$, Na_2HPO_4, NaH_2PO_4, Na_3PO_4, $NaHCO_3$, CH_3COONa, NaBr and NaI were of analytical grade and were used without further purification, and all their solutions were prepared by dissolving these commercial products into doubly distilled water. Tris–HCl buffer solution was used to control the acidity of the solutions. Millipore purified water (18.2 MΩ. cm) was used throughout.

Apparatus

A U-3010 spectrophotometer (Hitachi, Tokyo, Japan) was used to record absorption spectra and measure absorbance. All fuorescence measurements performed with a pH-510 digital pH-meter with a combined glass electrode (California, USA). A QL-901 vortex mixer (Haimen, China) was employed to blend the solutions in 1.5 mL tubes.

Pretreatment of the tea drinks samples

The three kinds of tea drink samples obtained from the local supermarket. They were centrifuged for 30 min at 12,000 r/min about three times and the supernatant solutions were filtered with 0.22 μm membranes, respectively. The obtained filtrates were transferred for further detection.

Experimental procedures

50 μL Tris–HCl buffer solution and 200μL 4, 4' , 4" - (1, 3, 5 -triazine-2, 4, 6-triyl)-tris (azanediyl))-tribenzoic acid working solution were mixed together at first in a 2.0 mL EP vial. Afterwards, an appropriate volume of Tb^{3+} solution was added and mixed. The mixture was then diluted to a certain volume with doubly distilled water and mixed thoroughly again. At last, a certain volume of the anion solution was added into the mixture and the final total volume was 500 μL. After mixing thoroughly, a series of solutions were retained for 30 min and then was

transferred for fluorescence measurements. All fluorescence spectra were measured upon excitation at 337.0 nm by keeping both the excitation and emission slit widths at 5.0 nm, the PMT voltage at 400 V and the scan speed at 3000 nm min^{-1}.

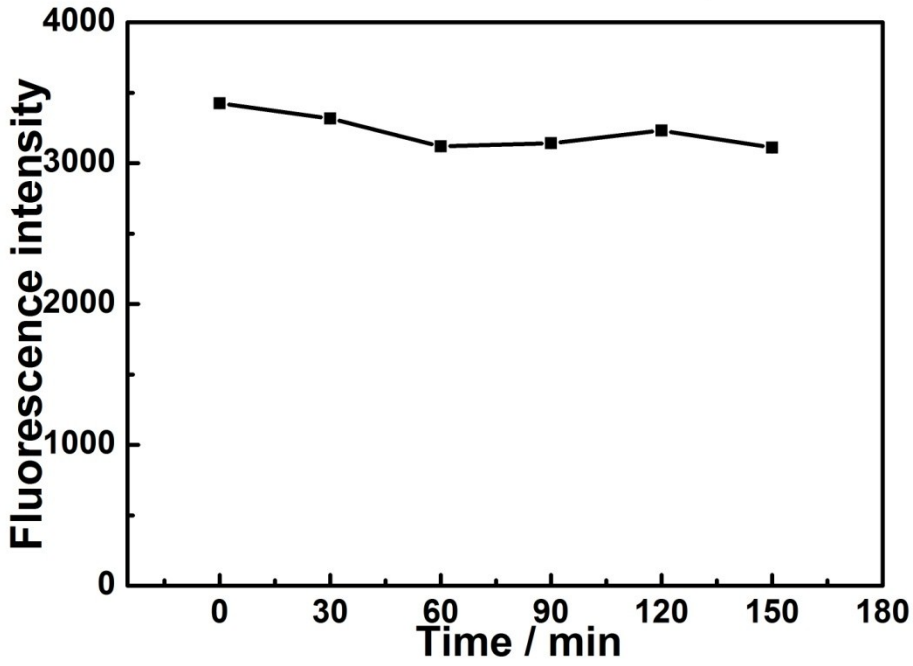

Fig S1. Effect of continuous excitations on the FL Intensities of Tb(III)-TATAB. $c_{H3TATAB}$, 5.0 × 10^{-4} mol/L; c_{Tb}^{3+}, 2.5× 10^{-4} mol/L; pH, 7.4 (Tris–HCl buffer).

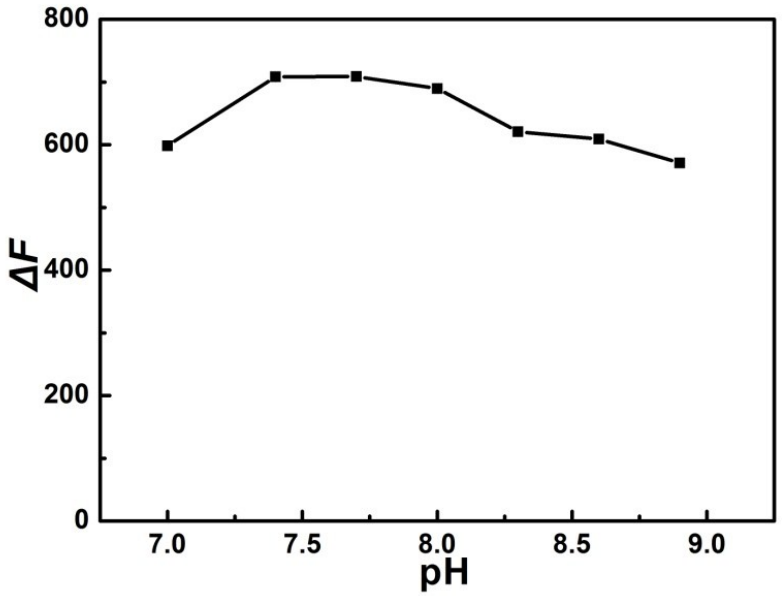

Fig S2. The effect of the pH on the binding processes between Tb(III)-TATAB and SHMP. $c_{H3TATAB}$, 5.0 × 10^{-4} mol/L; $c_{Tb^{3+}}$, 2.5× 10^{-4} mol/L; c_{SHMP}, 2.5 × 10^{-4} mol/L; pH, 7.4 (Tris–HCl buffer); Time, 30 min.

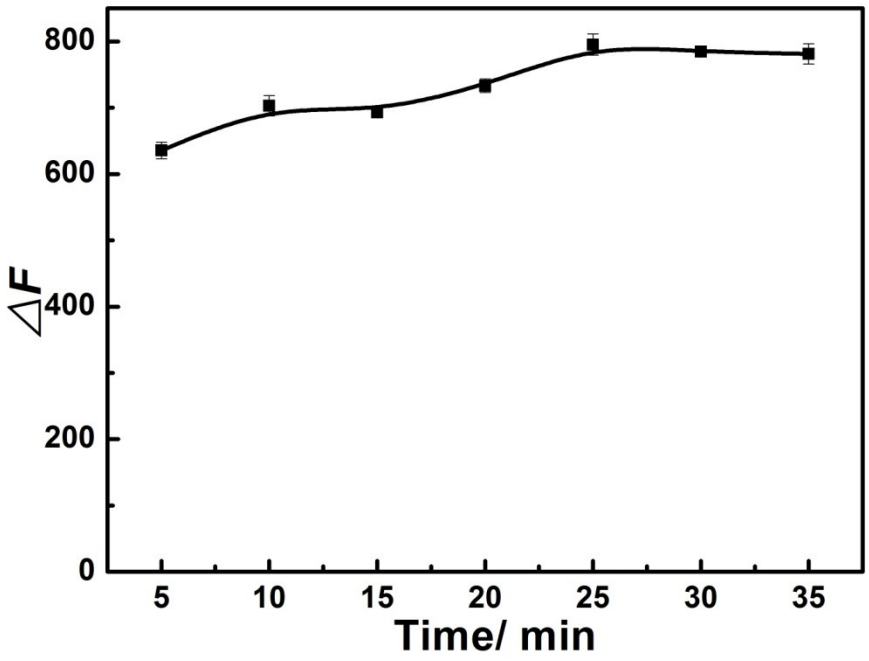

Fig S3. The effect of reaction time on the binding processes between Tb(III)-TATAB and SHMP. $c_{H3TATAB}$, 5.0 × 10^{-4} mol/L; $c_{Tb^{3+}}$, 2.5× 10^{-4} mol/L; c_{SHMP}, 2.5 × 10^{-4} mol/L; pH, 7.4 (Tris–HCl buffer); Time, 30 min.

Table S1. A comparison of different analytical techniques for determination of SHMP.

Method	linear range	Detection limit	Matrix	Reference
ion chromatography	**1-100 mg/Kg**	**5 mg/Kg**	**cod or scallop**	**[5]**
spectrophotometry	**3-10 μM**	**1.6 μM**	**tea drink**	**[2]**
	0.8-11 μM	**0.53 μM**	**beverages**	**[8]**
	0.6-10 μM	**0.53 μM**	**beverages**	**[10]**
SERS	**0.0125–0.3 μM**	**0.006 μM**	**tea water**	**[9]**
fluorescence spectrometry	**0.5-100 μM**	**0.38 μM**	**tea drink**	**This work**