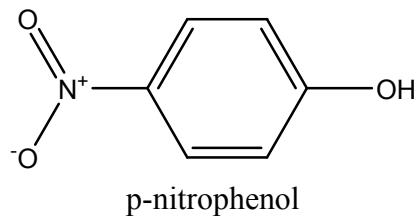
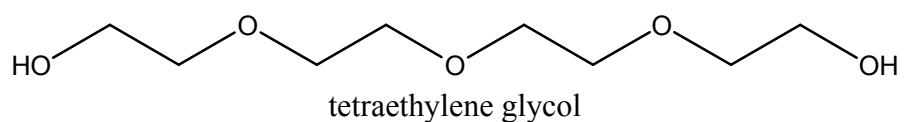
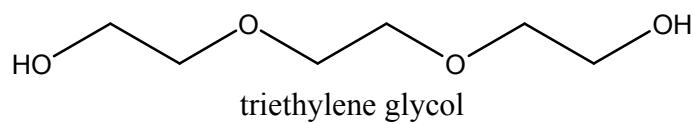
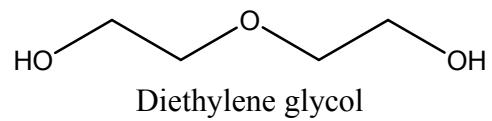
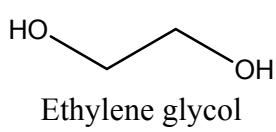


Glycol modified Gadolinium oxide nanoparticles as potential template for selective and sensitive detection of 4-nitrophenol

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Scheme S1. Chemical structure of various components used.

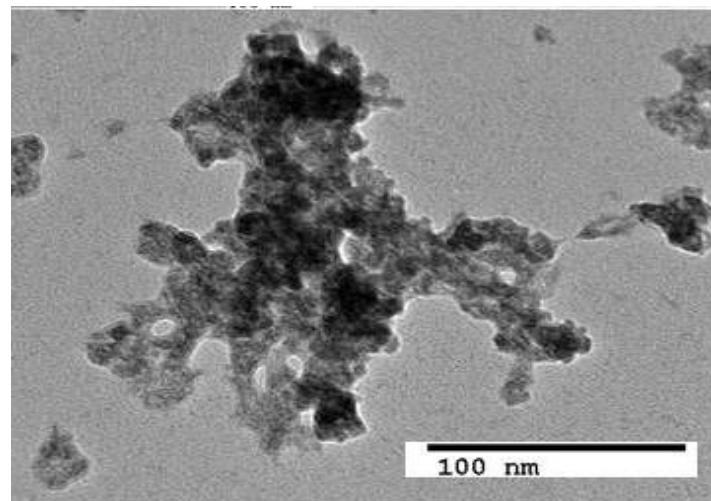


Fig. S1. TEM image of bared Gd_2O_3 nanoparticles without any capping.

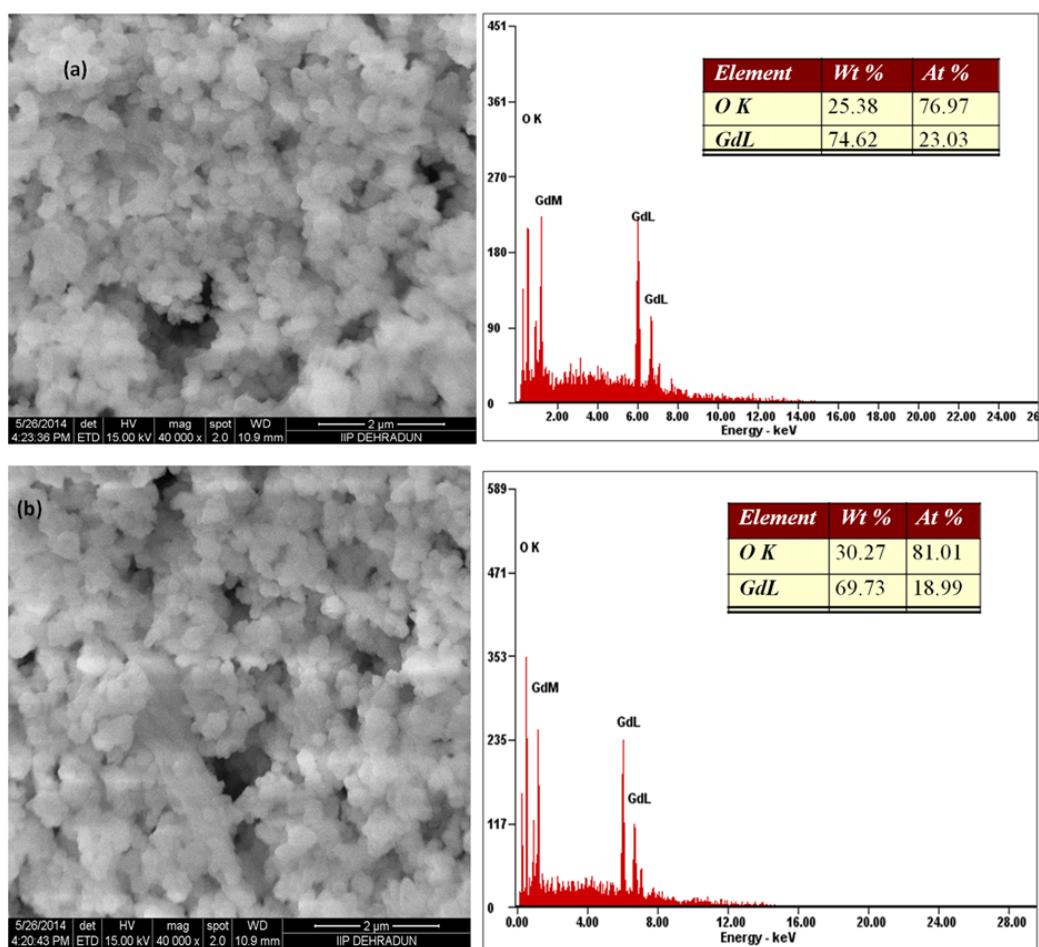


Fig. S2. SEM and EDS analysis of calcined samples of Gd_2O_3 nanoparticles synthesized by using (a) EG and (b) DEG coating.

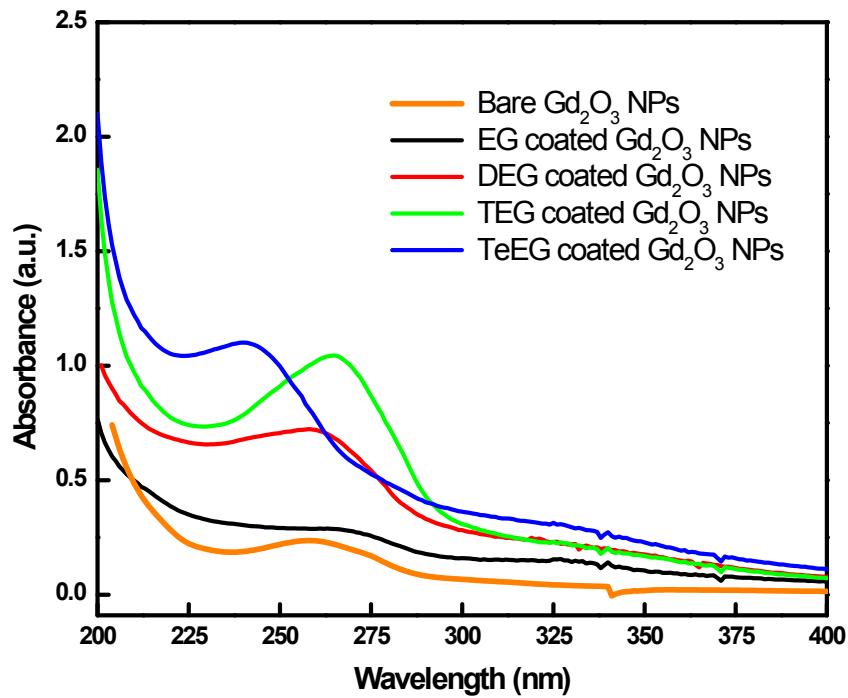


Fig.S3. UV-vis spectra of glycol coated-Gd₂O₃ nanoparticles.

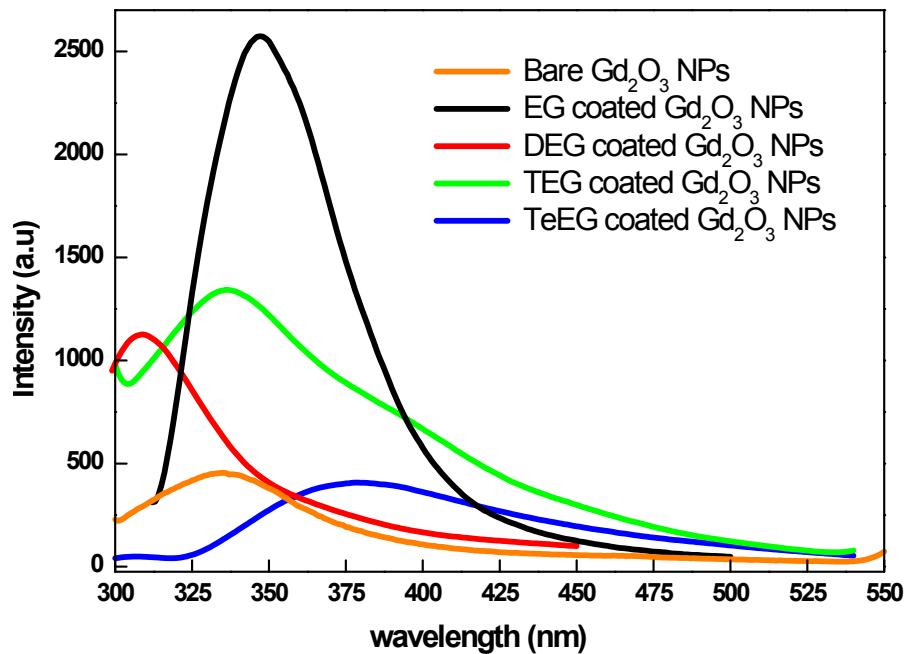


Fig.S4. Photoluminescence spectra of Gd₂O₃ nanoparticles in different glycals.

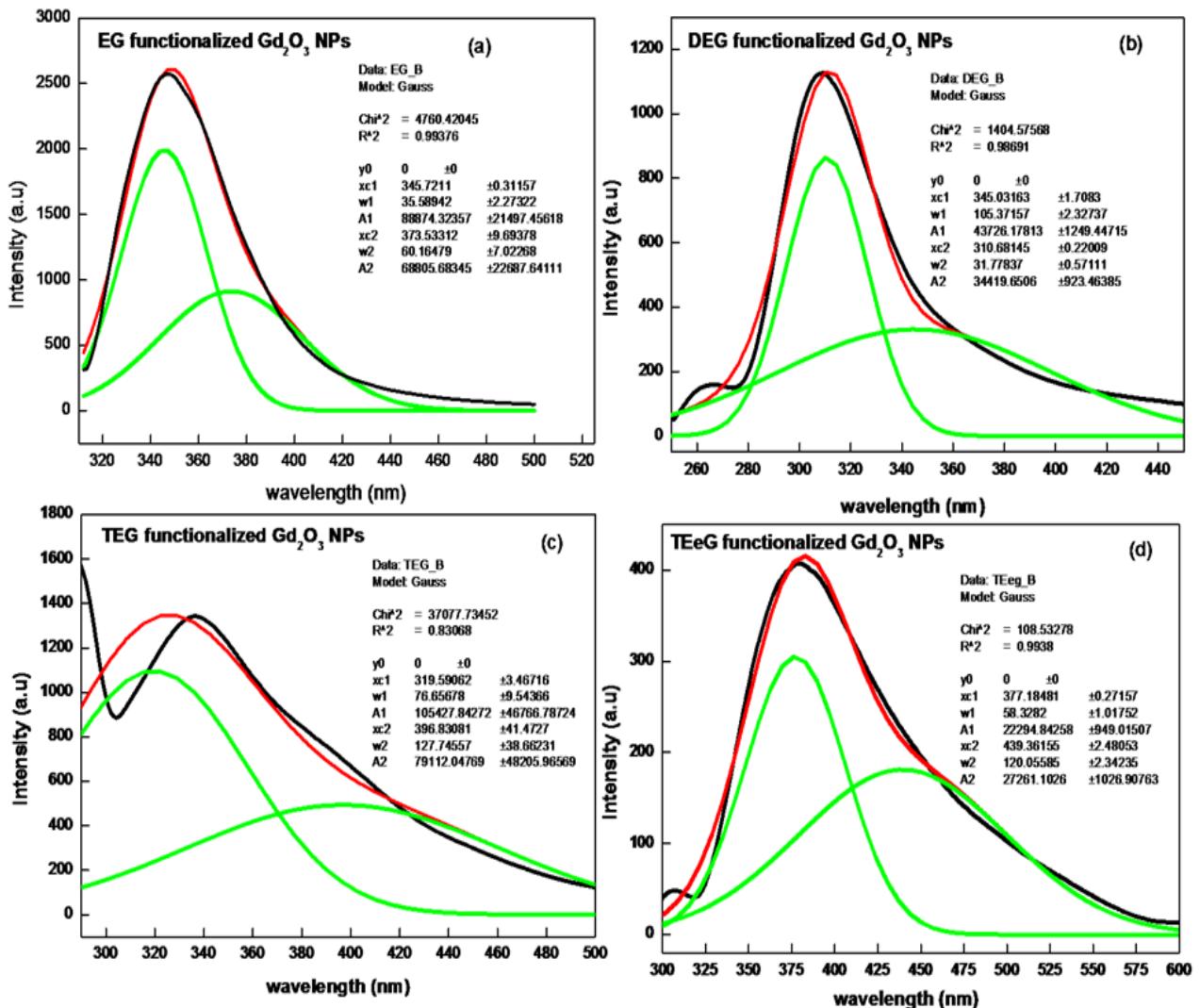


Fig. S5. Deconvolution of individual fluorescence spectra for different glycol modified Gd_2O_3 nanoparticles.

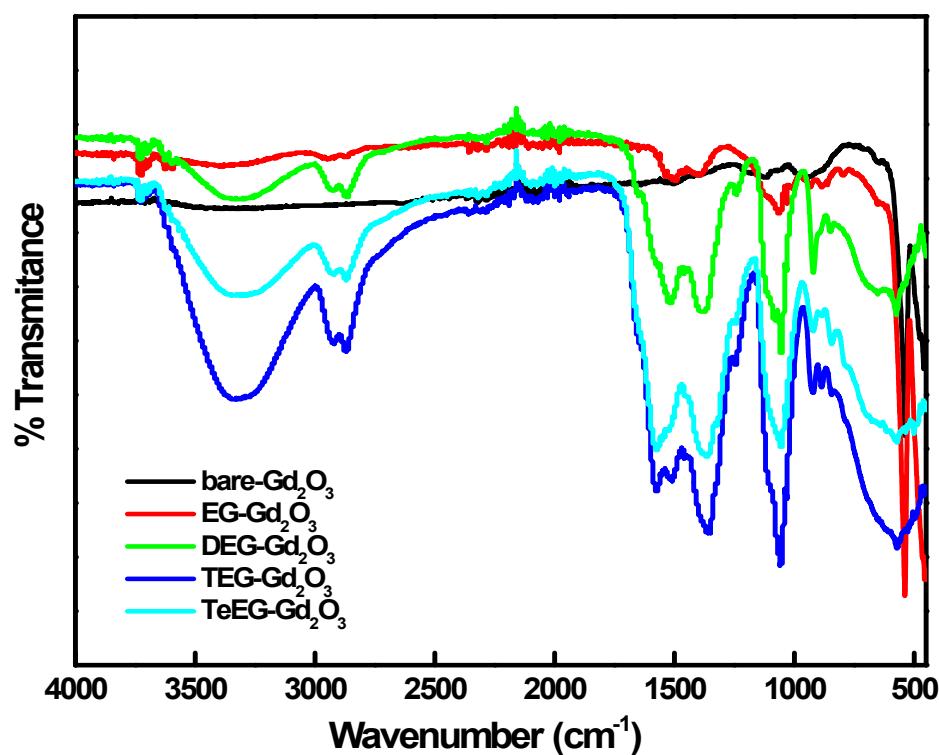


Fig. S5. FTIR spectra of glycol coated Gd_2O_3 nanoparticles.

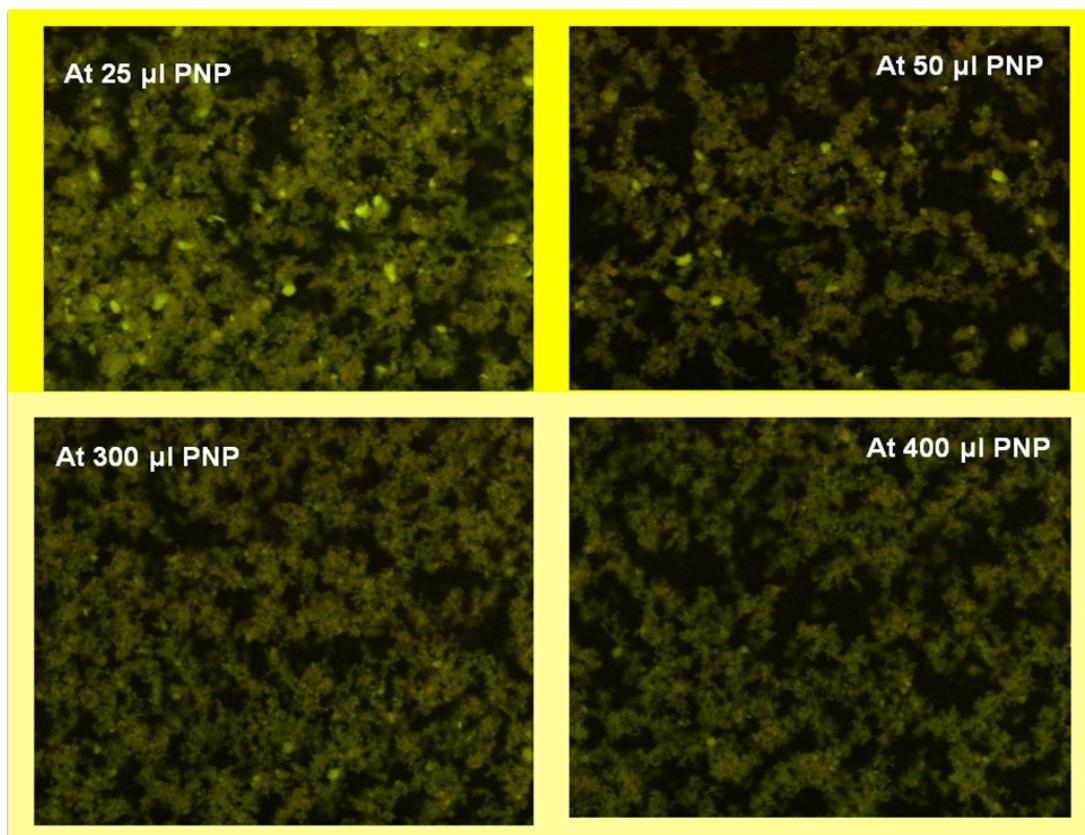


Fig. S6. Digital Fluorescence Optical microscope images of EG coated Gd_2O_3 nanoparticles with varied concentrations of PNP.

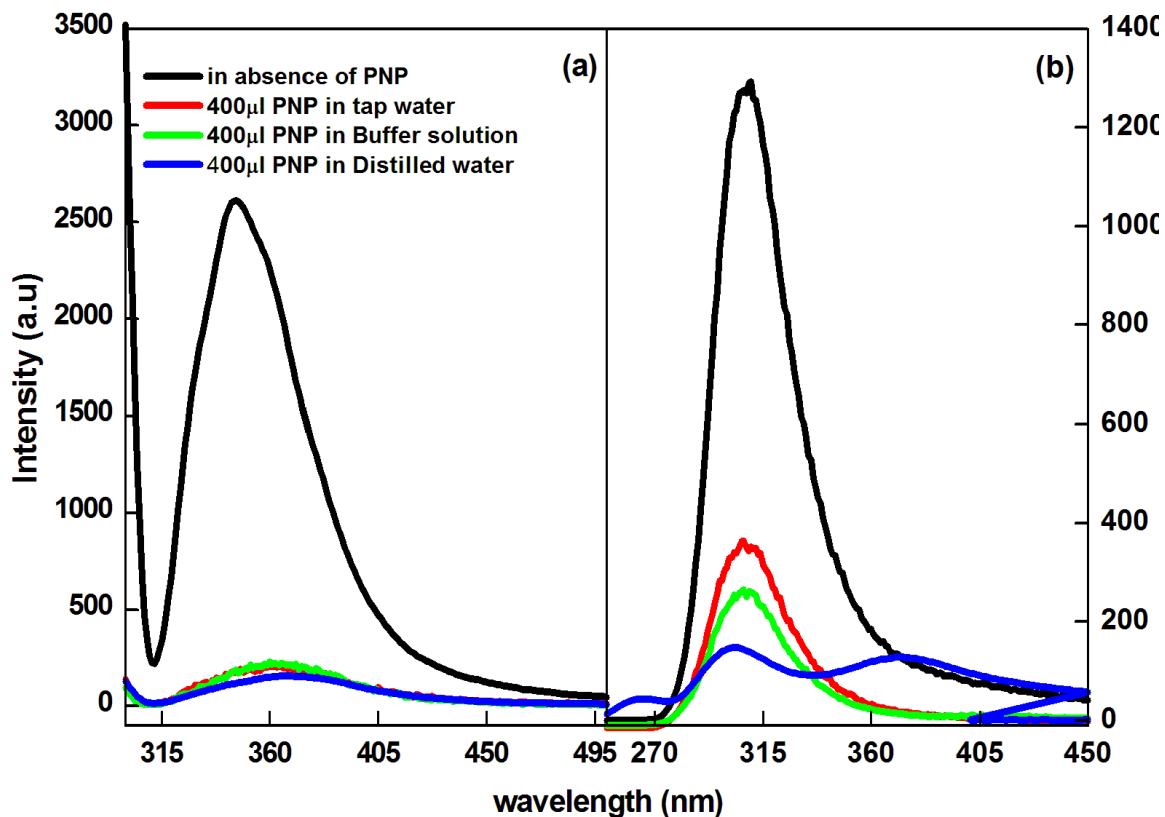


Fig.S7. Fluorescence emission spectra of (a) EG functionalized and (b) DEG functionalized Gd₂O₃ nanoparticles in presence of 400μL PNP in different sources of water.

Table S1. Summary of the Stern–Volmer Equations for the Fluorescence quenching of glycol modified Gd₂O₃ nanoparticles by PNP.

System	K _{SV}	R	Detection limit (M)
EG coated Gd ₂ O ₃ Nps	4.91x 10 ⁻²	0.9962	3.73 x 10 ⁻⁷
DEG coated Gd ₂ O ₃ Nps	1.13 x 10 ⁻²	0.9984	2.39 x 10 ⁻⁷
TEG coated Gd ₂ O ₃ Nps	5.96 x 10 ⁻³	0.9992	1.80 x 10 ⁻⁷
TeEG coated Gd ₂ O ₃ Nps	1.94 x 10 ⁻³	0.9991	1.76 x 10 ⁻⁷

Table S2. Average percentage recovery and relative standard deviations of PNP in different spiking solutions.

Samples	Added (μM^{-1})	RSD (%)	Recovery (%)
EG			
Tap water	10.0	2.7	96.2
	175	2.6	96.4
	225	2.8	96.1
Buffer solution	10.0	3.5	95.1
	175	4.5	93.8
	225	5.0	92.9
Distilled water	10.0	1.9	97.3
	175	2.3	96.8
	225	3.1	95.7
DEG			
Tap water	10.0	5.4	92.6
	175	3.8	94.7
	225	3.7	94.8
Buffer solution	10.0	6.9	90.1
	175	3.8	94.8
	225	2.4	96.7
Distilled water	10.0	3.6	95.1
	175	2.7	96.7
	225	4.9	93.3
TEG			
Tap water	10.0	7.1	89.6
	175	5.2	92.8
	225	3.8	94.3
Buffer solution	10.0	5.8	92.1
	175	6.4	91.3
	225	3.7	94.8
Distilled water	10.0	5.4	92.5
	175	4.3	93.6
	225	4.1	93.8
TeEG			
Tap water	10.0	6.5	91.2
	175	3.1	92.7
	225	2.6	93.3
Buffer solution	10.0	4.5	93.9
	175	4.0	94.4
	225	4.8	93.4
Distilled water	10.0	2.8	96.1
	175	1.6	97.7
	225	1.8	97.5