Electronic Supplementary Material (ESI) for New Journal of Chemistry.

Supporting Information

Molecularly imprinted polymers on CdS quantum dots for sensitive determination of cefixime after its preconcentration by magnetic graphene oxide

Habibeh Eskandari [a], Maliheh Amirzehni [b,], Hamideh Asadalahzadeh [a], and parvin Alizadeh Eslami [b]*

[a.] *Department of Chemistry, Kerman Branch, Islamic Azad University, Kerman, Iran.*

[b.] *Department of Chemistry, Tabriz Branch, Islamic Azad University, Tabriz, Iran. Tel: +989143110806; Fax: +984133333458; Email: Maliheamirzehni@iaut.ac.ir.*

Table S1 Comparison between the developed method and some previously reported methods for cefixime determination

Method	**sample**	**Linear range ($\mu g\ mL^{-1}$)**	**Detection limit ($ng\ mL^{-1}$)**	**Ref**
Tb sensitized fluorescence	Pharmaceutical samples	2.22-13.6	170	1
Voltammetric	Tablets	0.05-25	4	2
HPLC	Human plasma	0.004-5	1	3
spectrophotometry	Pharmaceutical samples	2.5–35	175	4
Spectrofluorometric	Pharmaceutical samples	60-72400	28×10^3	5
Spectrofluorometric	Pharmaceutical samples	2–40	1.3×10^3	6
Developed work	Pharmaceutical and urine samples	0.001-0.7	0.54	-

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Table S2 Interfering effects of different species on the determination of 1 mg L^{-1} cefixime (in optimum condition)

Coexisting substance	Tolerance limit (interference to analyte ratio)
Na^+, K^+, Cl^-	3500
Ca^{2+}, Al^{3+}, Oxalate	1500
Zn^{2+}, Fe^{2+}, Mn^{2+}, PO_4^{3-}, HCO_3^-, CH_3COO^-, SO_4^{2-}, NO_3^-	500
Cu^{2+}, Mg^{2+}, CO_3^{2-}, Urea	250
Fe^{3+}, Ni^{2+}, Cr^{3+}, Glucose, Uric Acid	150
Ascorbic acid, Citrate, Glutathione	100
I^-, Pb^{2+}, Cd^{2+}	50
Cysteine , Hg^{2+}	25

Table S3 Results of cefixime determination in the real samples by established system

Sample	Add	Found [a]	Recovery % ± RSD	t-statistic [b]
Tablet (200 mg)	0	192.77±1.72	-	-
	50	48.04±1.68	96.08±3.50	1.98
	100	98.72±1.80	98.72±1.83	1.00
Suspension (5 mg)	0	4.94±0.03	-	-
	2.0	2.02±0.01	100.91±0.73	3.40
	5.0	5.01±0.02	100.29±0.40	0.85
Urine	0	ND	-	-
	0.50	0.483±0.008	96.60±1.53	3.01
	1.0	0.976±0.006	97.63±0.58	2.31

[a] Mean of three determinations ± standard deviation, [b] t-critical=3.18 for n=3 and P=0.05

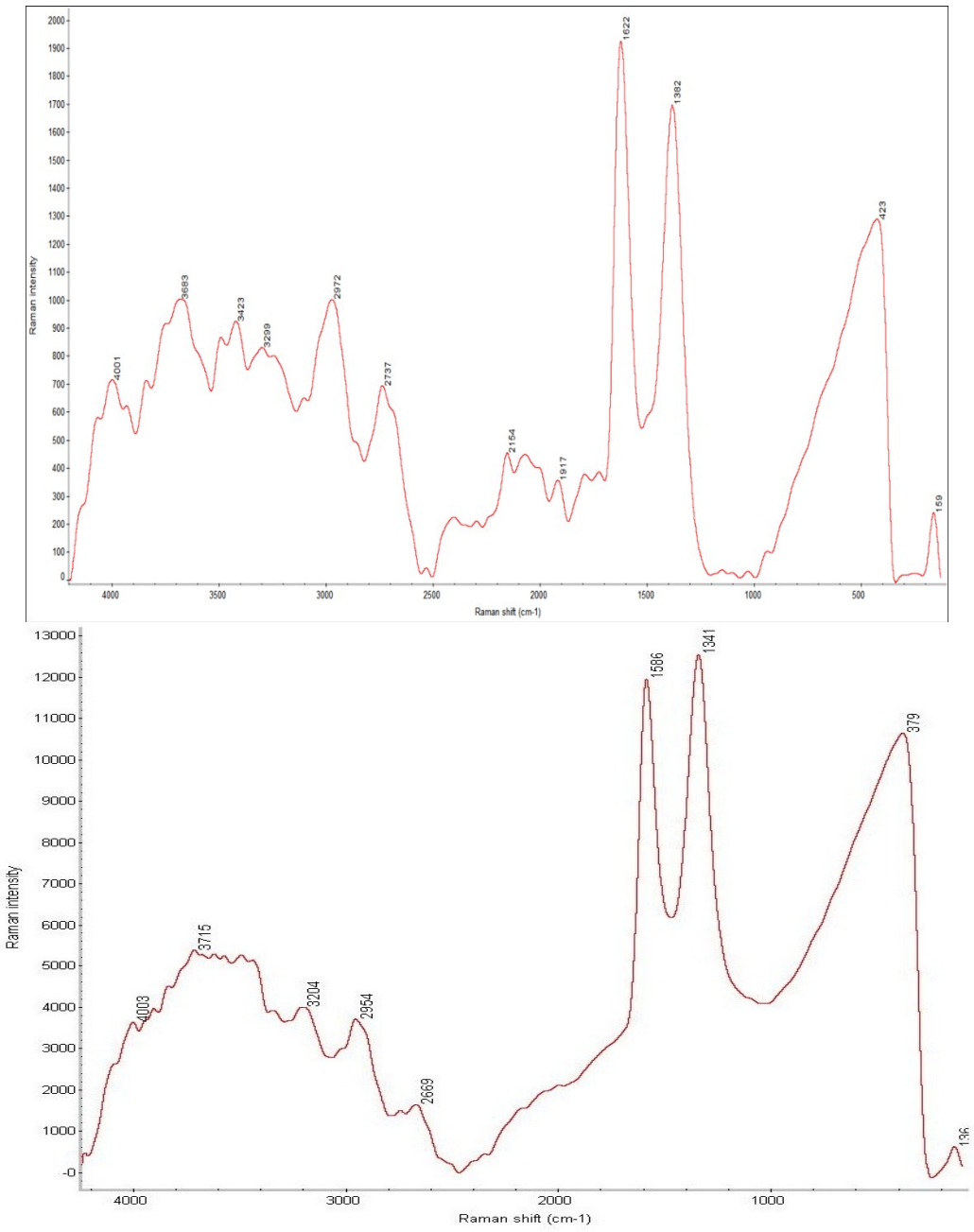


Fig. S1 a) Raman spectra for GO (upper) and magnetic modified GO (under)

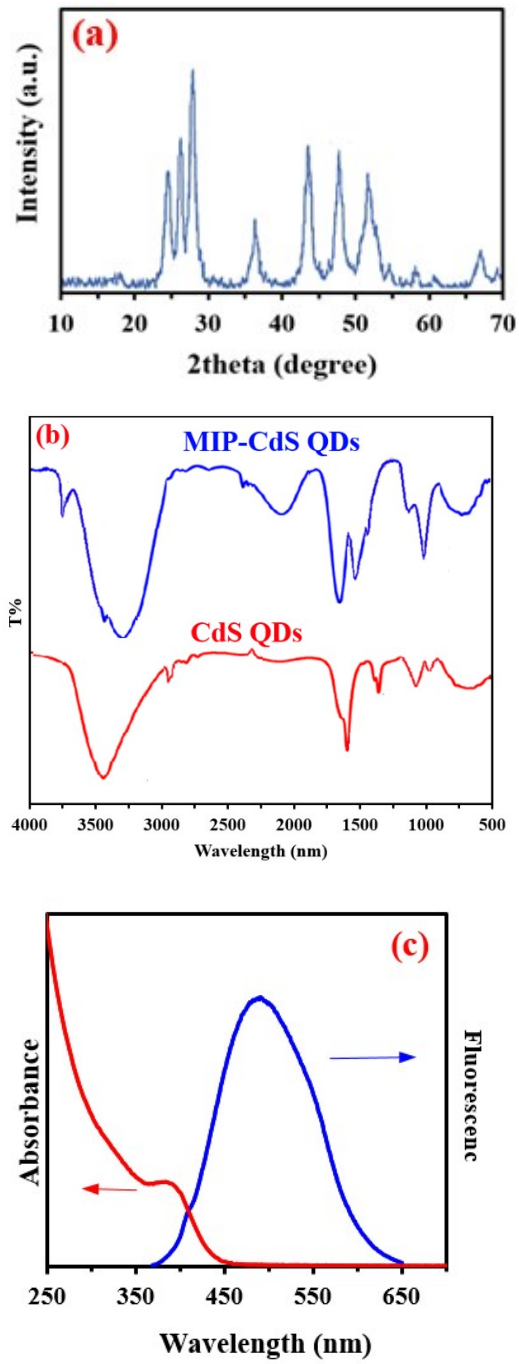
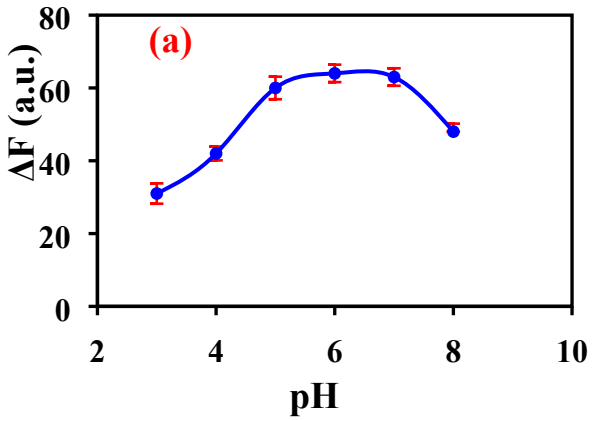
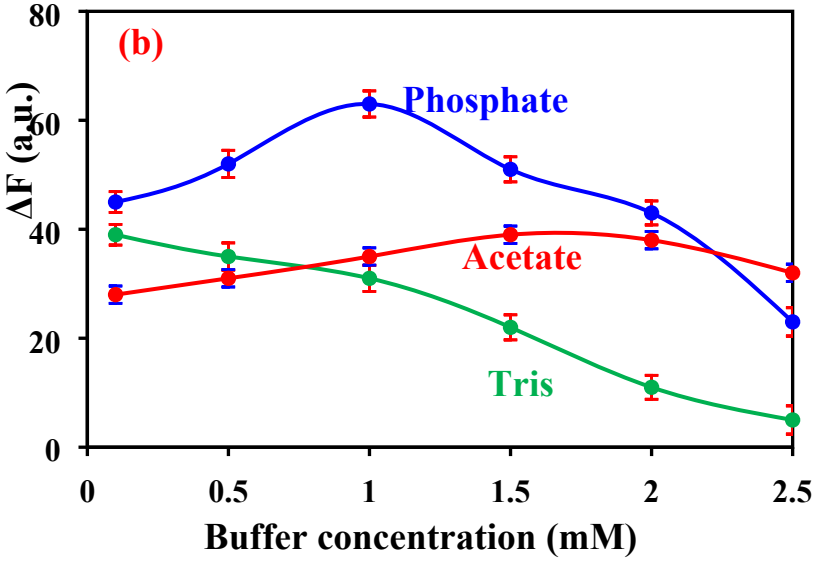
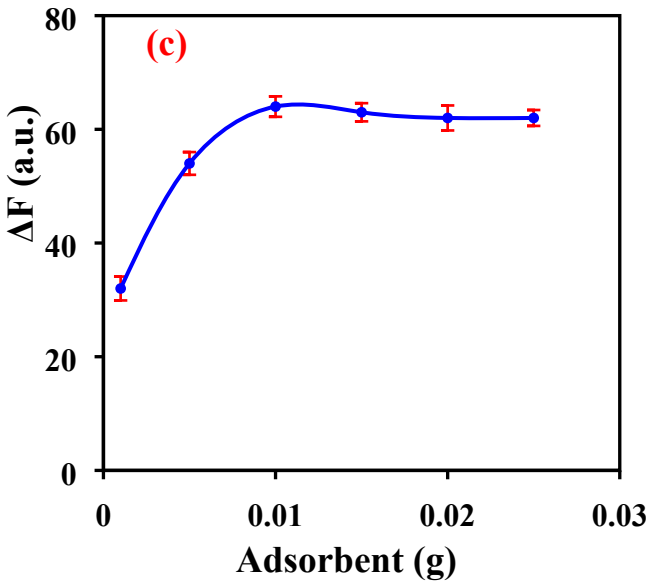


Fig. S2 a) XRD pattern for CdS QDs, b) FTIR for CdS QDs and MIP-CdS QDs and c) adsorption and fluorescence spectra for MIP-CdS QDs


(a)
ΔF (a.u.)
0
20
40
60
80
2
4
6
8
10
pH


(b)
ΔF (a.u.)
Phosphate
Acetate
Tris
0
20
40
60
80
0
0.5
1
1.5
2
2.5
Buffer concentration (mM)


(c)
ΔF (a.u.)
0
20
40
60
80
0
0.01
0.02
0.03
Adsorbent (g)

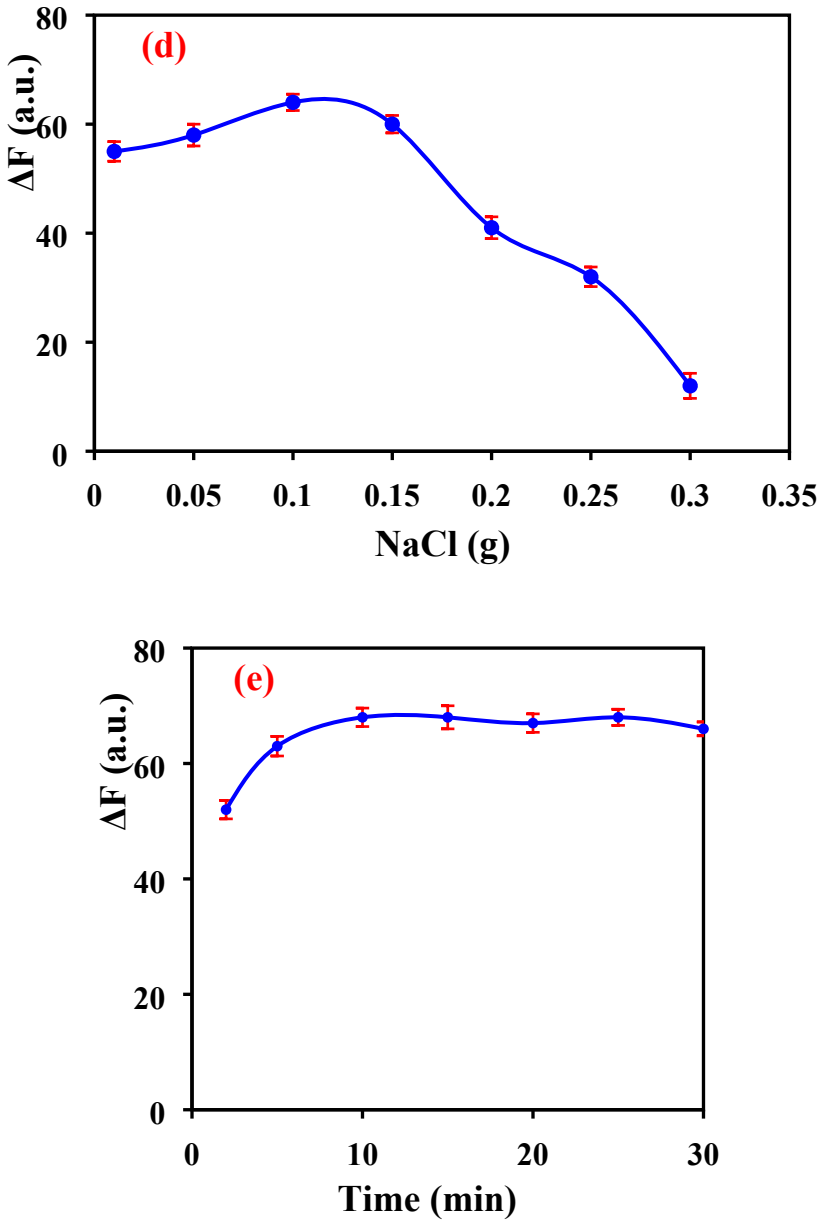


Fig. S3 Optimization curves for extraction step

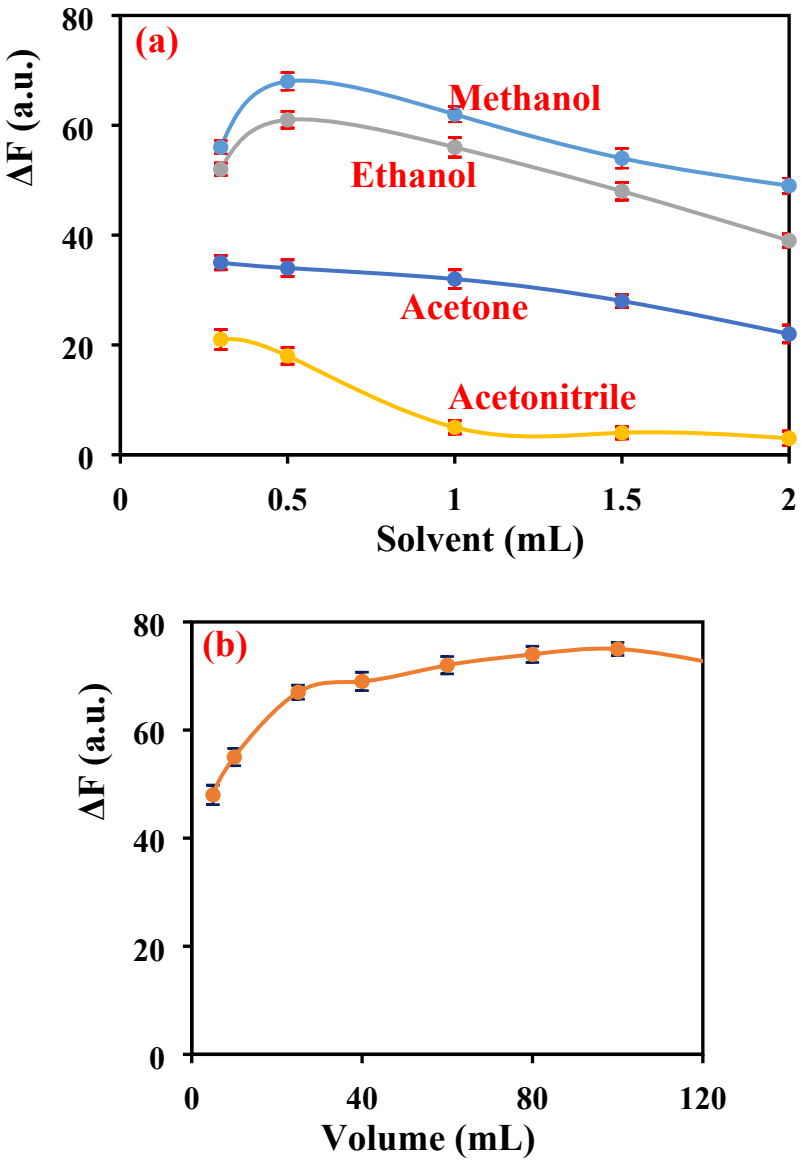


Fig. S4 Optimization curves for extraction step

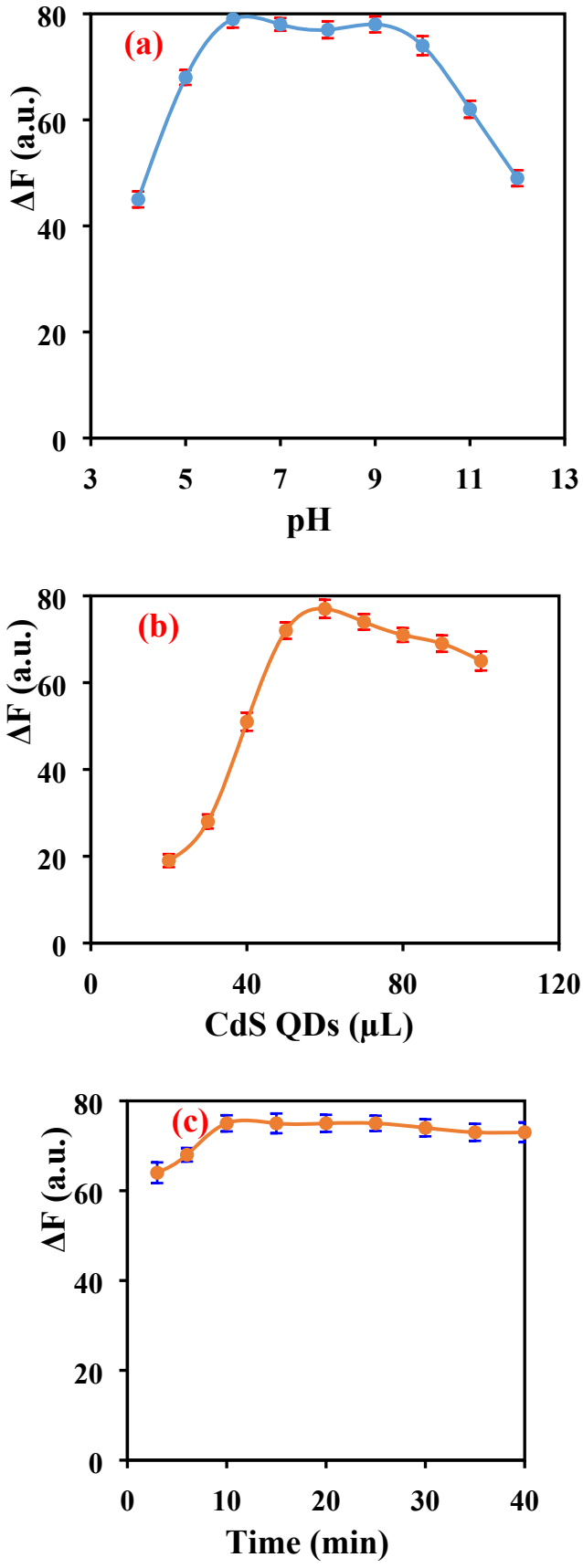


Fig. S5 Optimization curves for fluorescence detection step

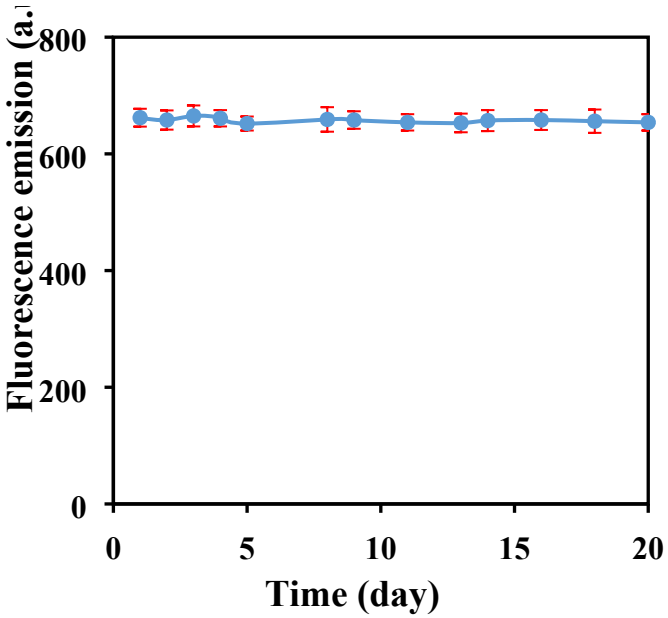


Fig. S6 Fluorescence emission of MIP-CdS QDs in successive control during different days

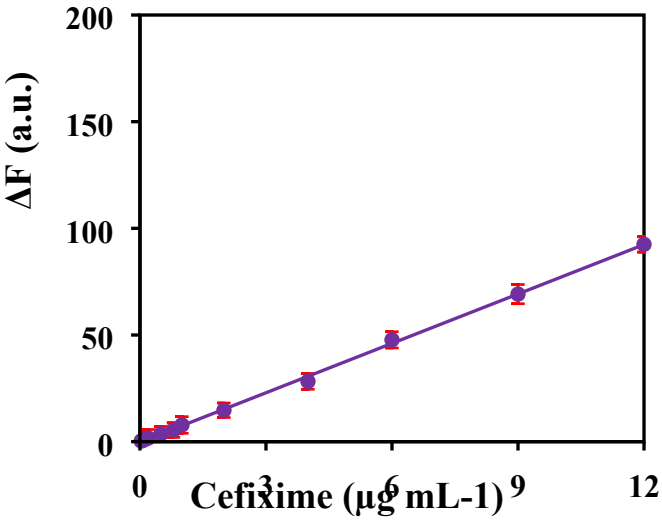


Fig. S7 Calibration graph for the determination of cefixime by MIP-CdS QDs system without any preconcentration procedure

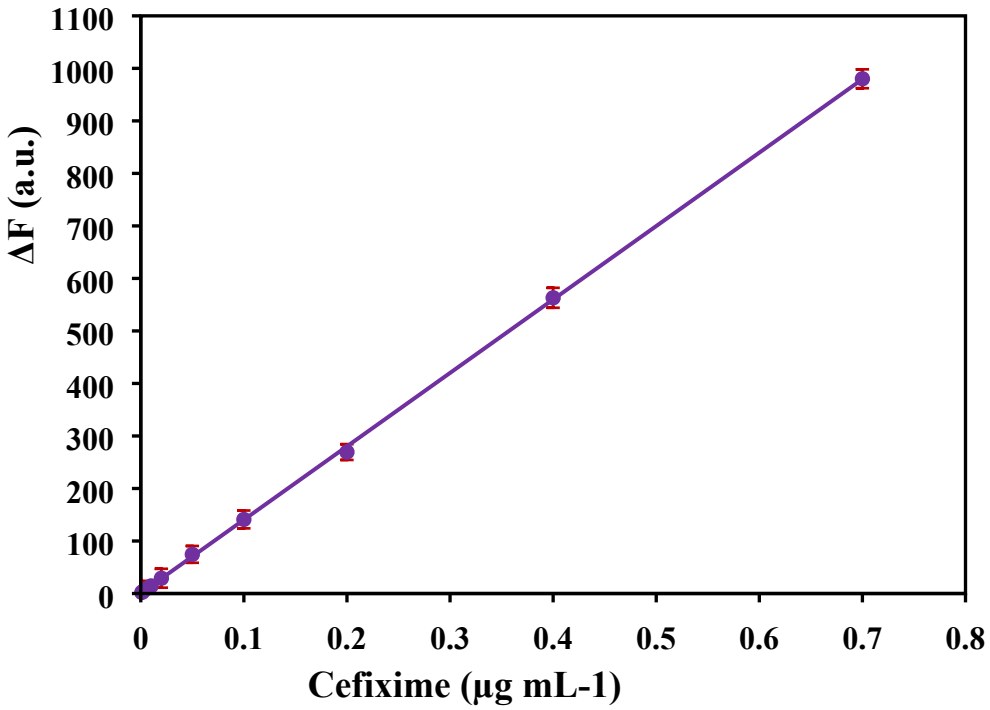


Fig. S8 Calibration graph for the determination of cefixime by MIP-CdS QDs system after its preconcentration by Fe_3O_4@SiO_2-GO.