

RNA templated water soluble $Mg^{2+}/PbSe$ porous nanostructures with dual fluorescence

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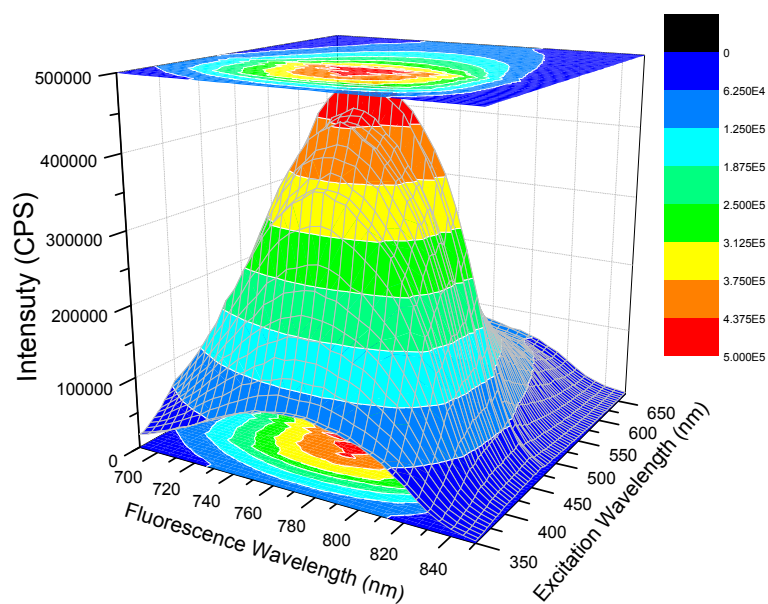


Fig.S1a 3D excitation – fluorescence spectra of SP1 in visible region.

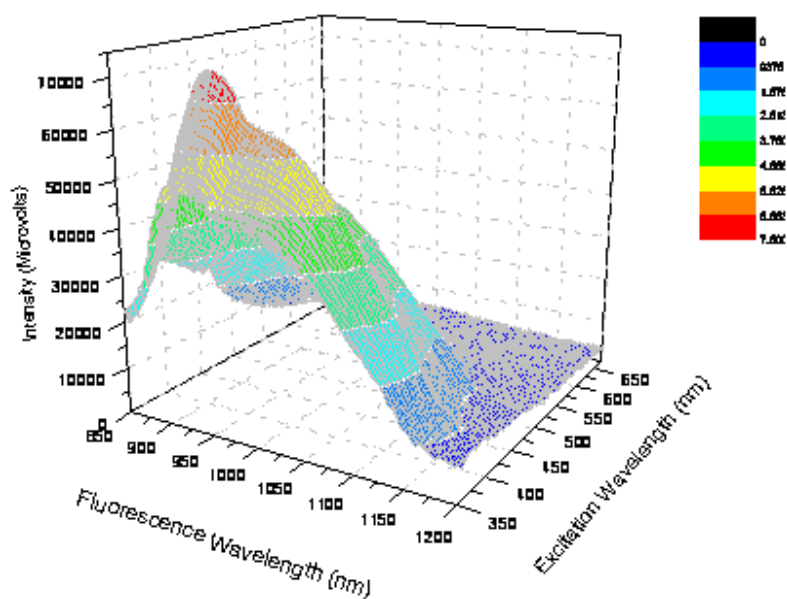


Fig. S1b Optimization of excitation and fluorescence wavelength in NIR region.

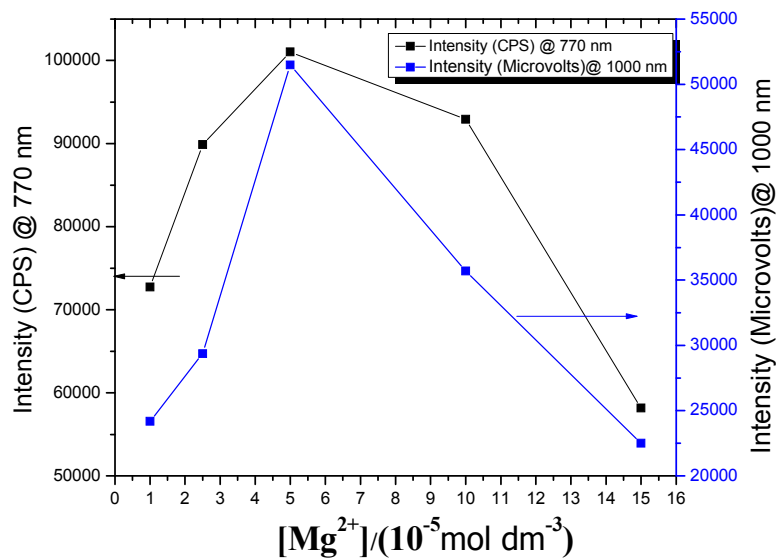


Fig. S1c Effect of internal addition of $[Mg^{2+}] / (10^{-5} \text{ mol dm}^{-3})$ (1.0, 2.5; 5.0; 10.0; 15.0) on fluorescence peak in visible (left) NIR (right) range.

AFM grain/pore analysis histograms

Grain Analysis SP1 Fresh

Grains Size: 2.0 nm; Grains collected: 225

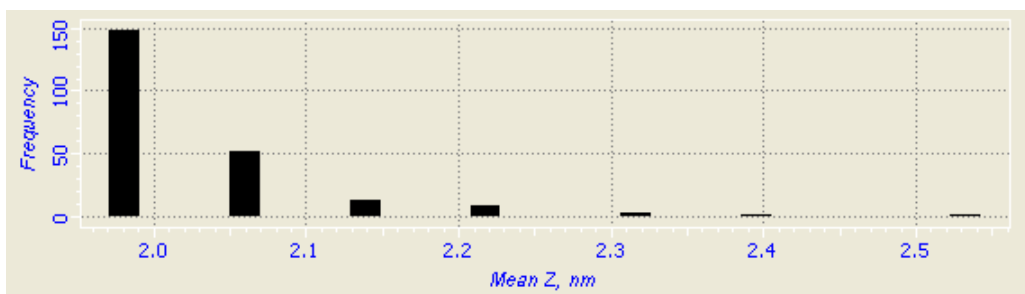


Fig. S2a Histogram of Fresh SP1.

Pores Analysis SP1 aged

Pore Size: 3.2 nm; Pores collected: 191

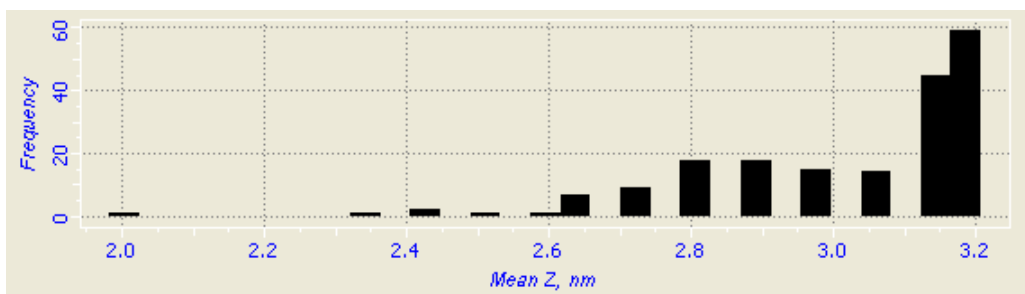


Fig. S2a' Histogram of aged SP1.

Pores Analysis of Fresh SP2

Pore Size: 2.5 nm; Pores collected: 512

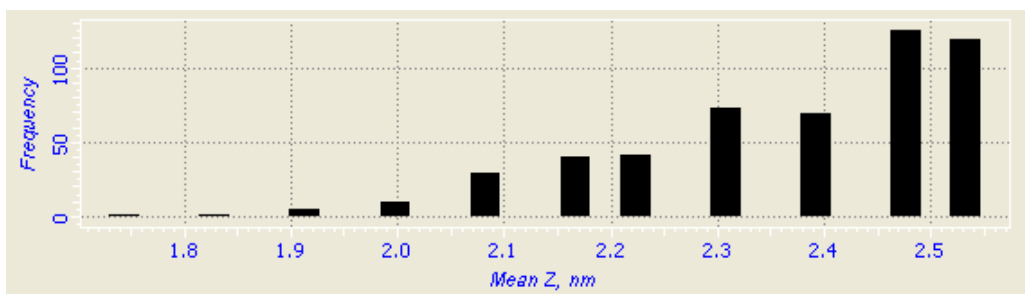


Fig. S2b Histogram of fresh SP2.

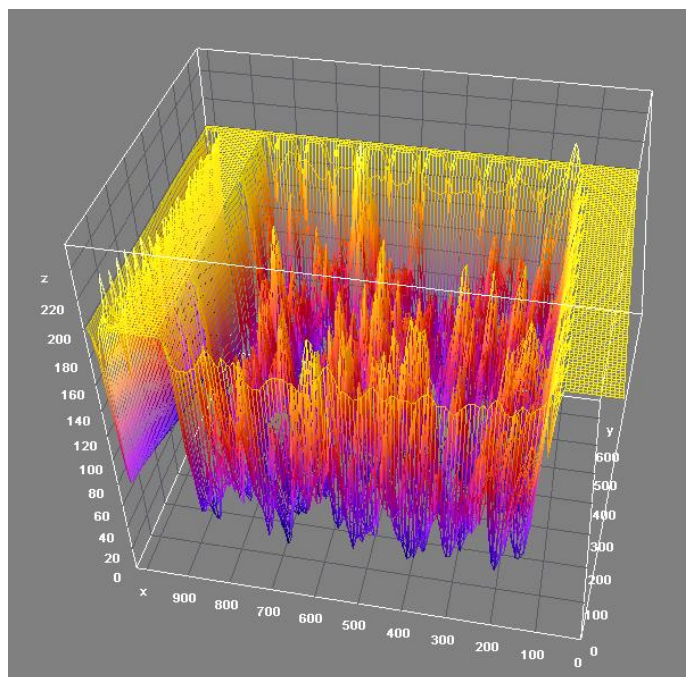


Fig. S2b' 3D view of AFM image of SP2 (fresh) with the help of *image J* software.

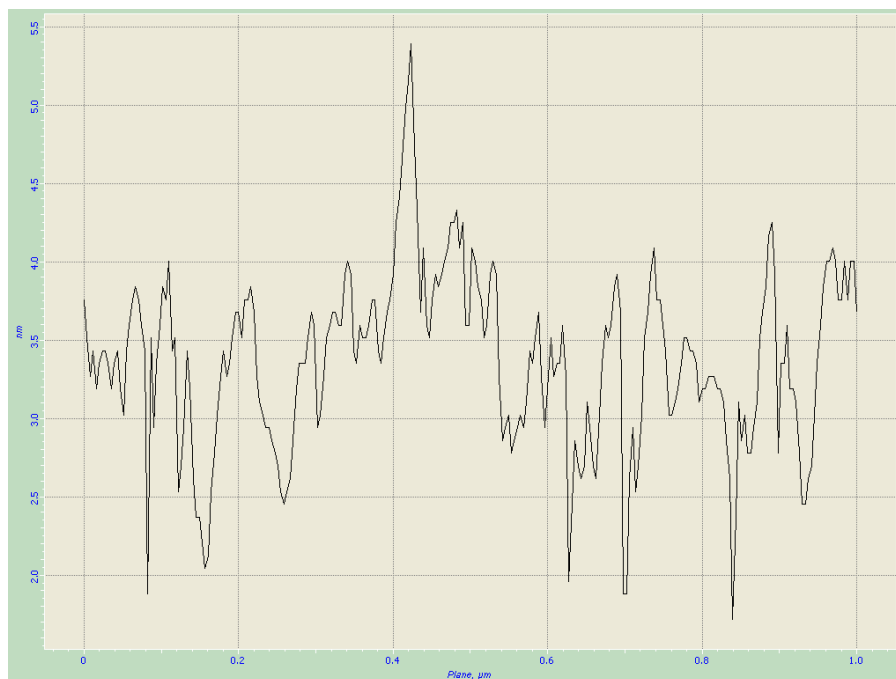


Fig. S2c Depth of pores of fresh SP2 along Y axis



Fig. S2d Depth of pores of fresh SP2 along X axis.

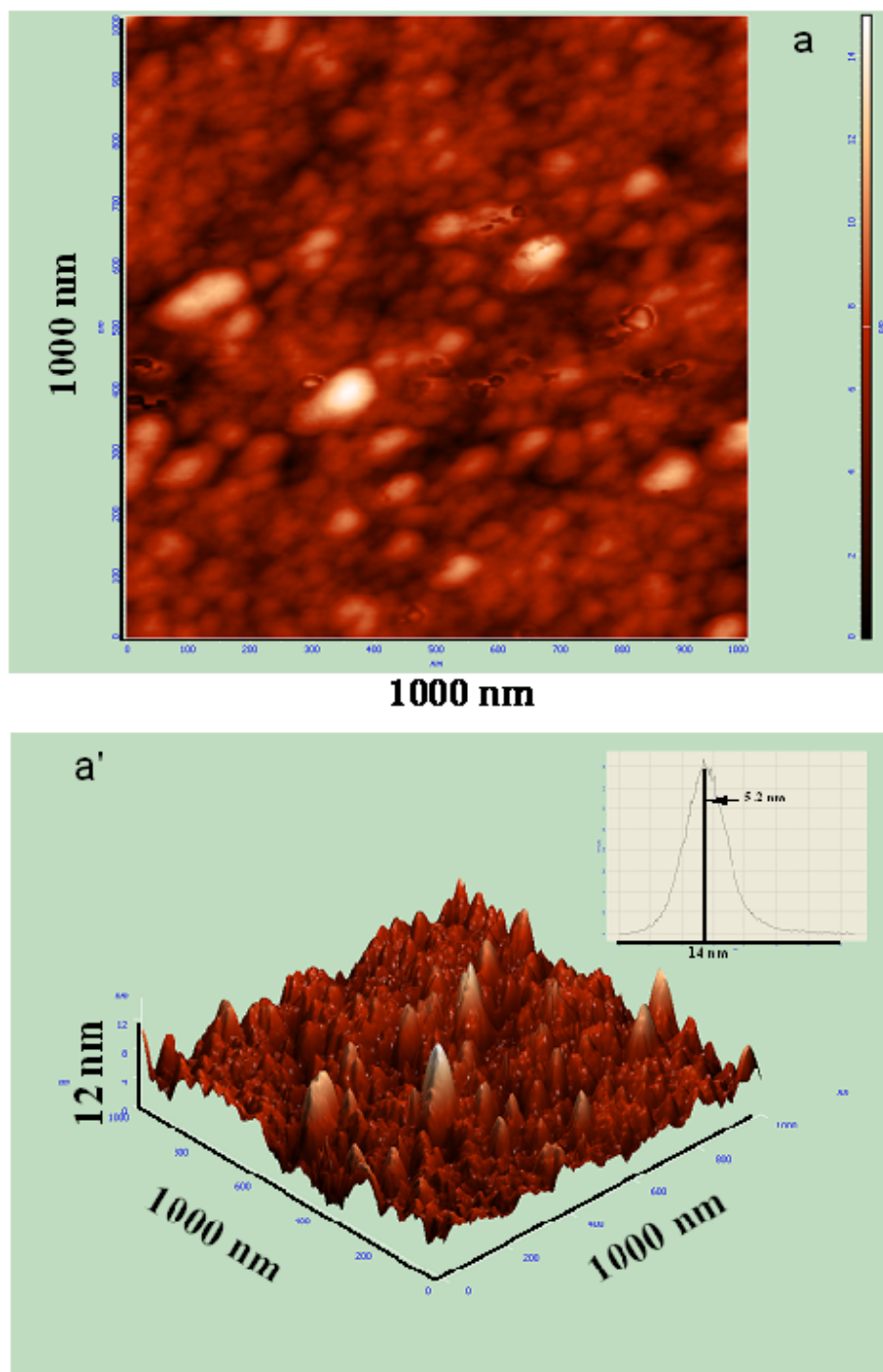


Fig. S2d' AFM images of fresh SP3: 2D (a) and 3D (a'), Inset: Roughness histogram.

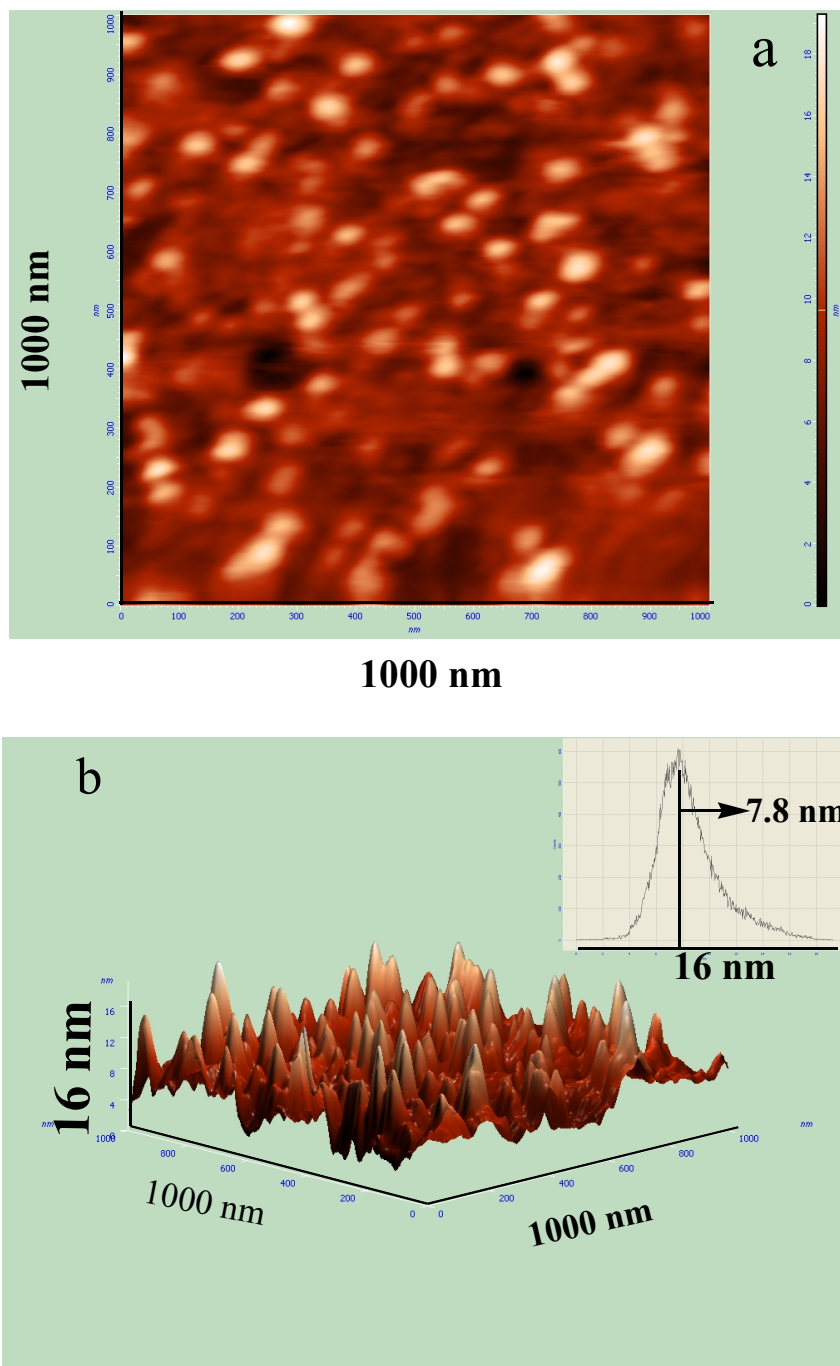


Fig. S3A AFM images of fresh SB: 2D (a) and 3D (b); Inset: Roughness histogram

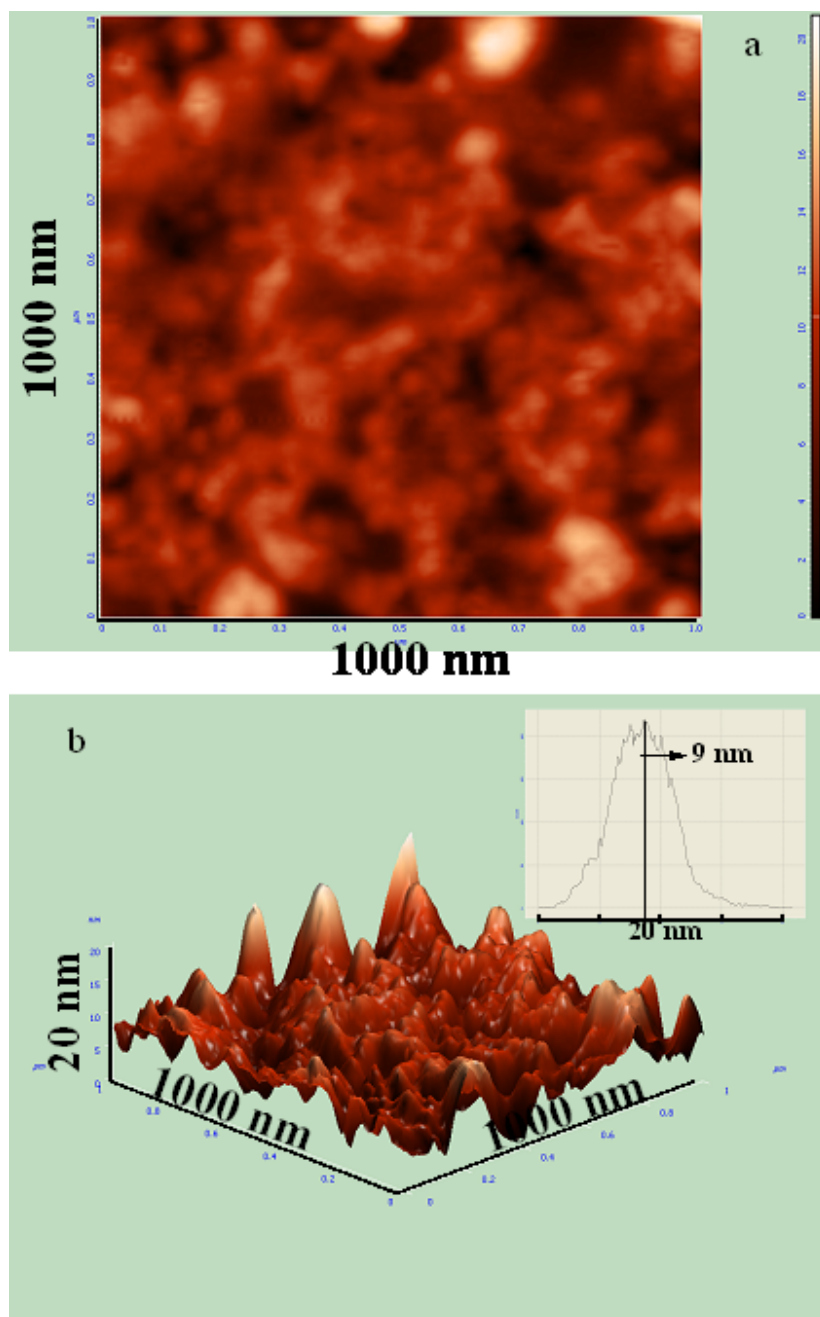


Fig. S3B AFM images of fresh SB1: 2D (a) and 3D (b), Inset: Roughness histogram.

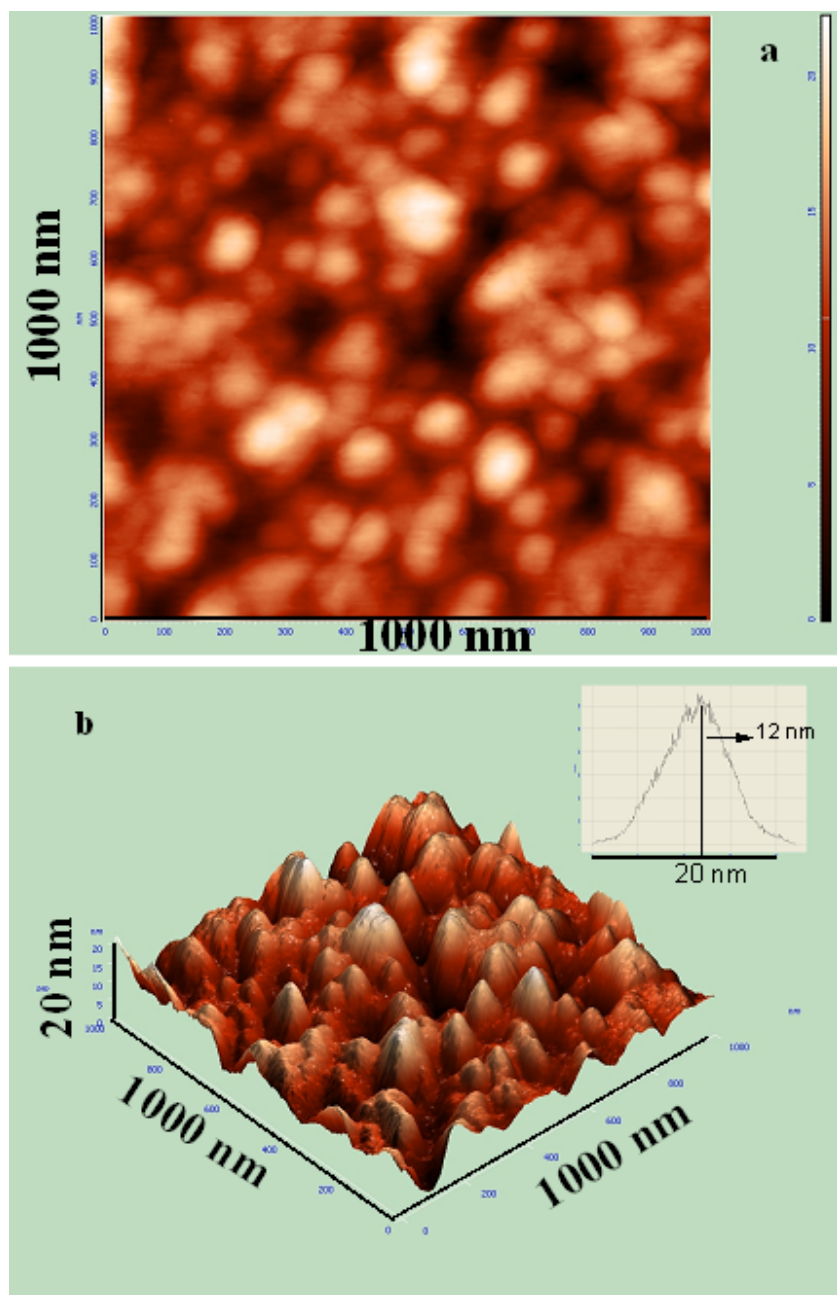


Fig. S3B' AFM images of aged SB1: 2D (a) and 3D (b). Inset: Roughness histogram.

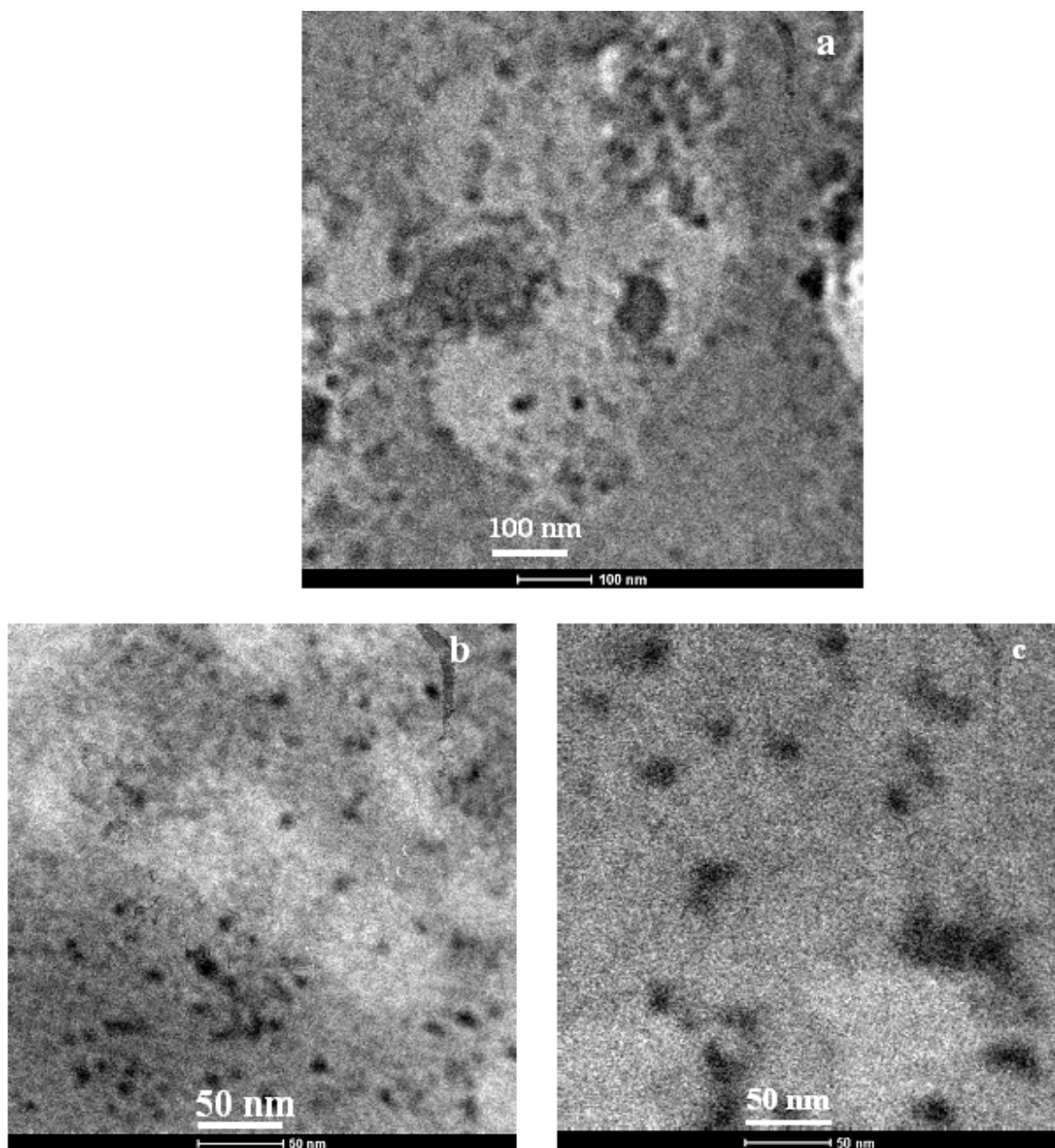


Fig.S4 TEM micrographs of SB (a), SB1 (b) and SB2 (c).

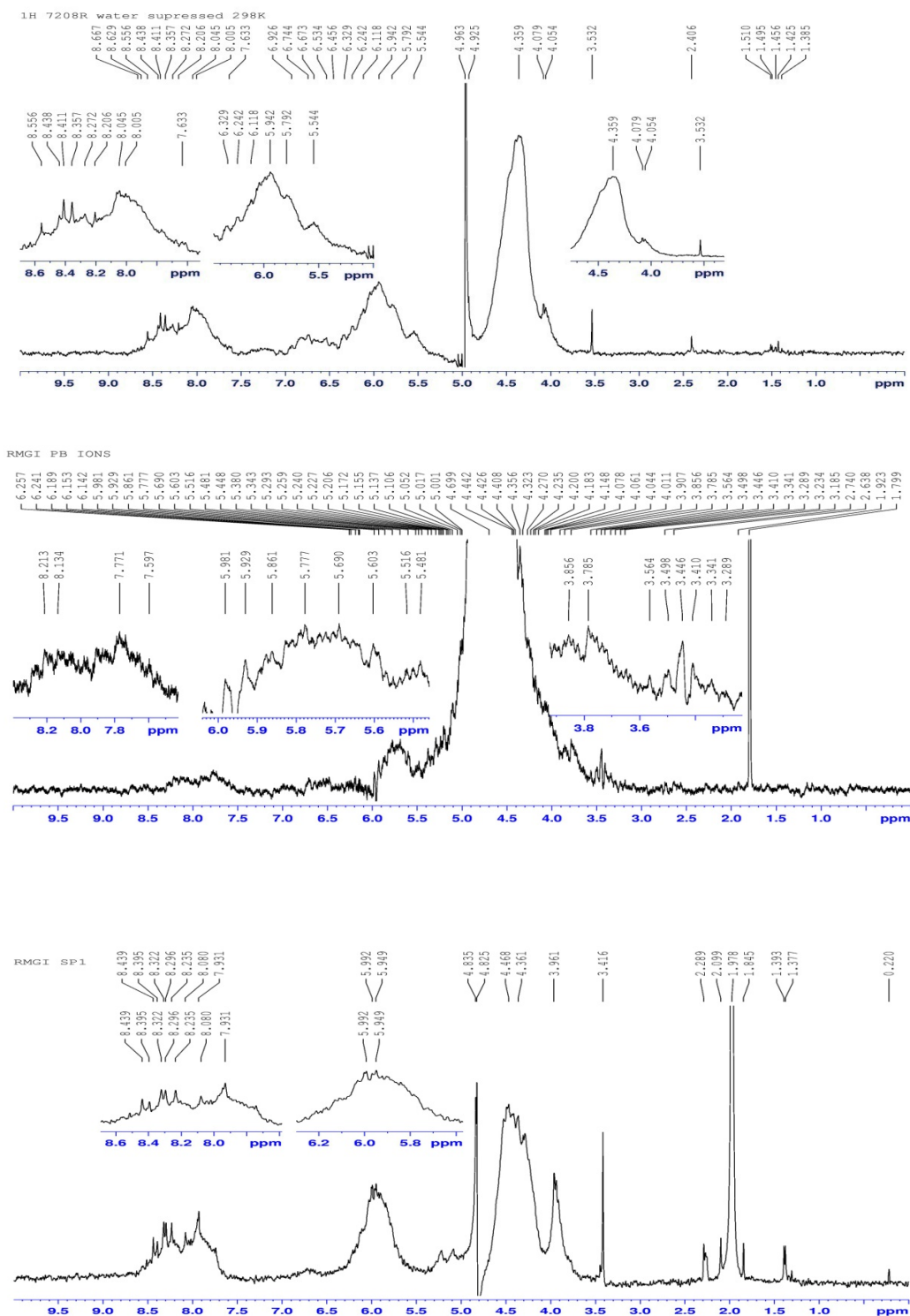


Fig. S5A ¹H NMR spectra of SB, SB1, and SP1 (top to bottom)

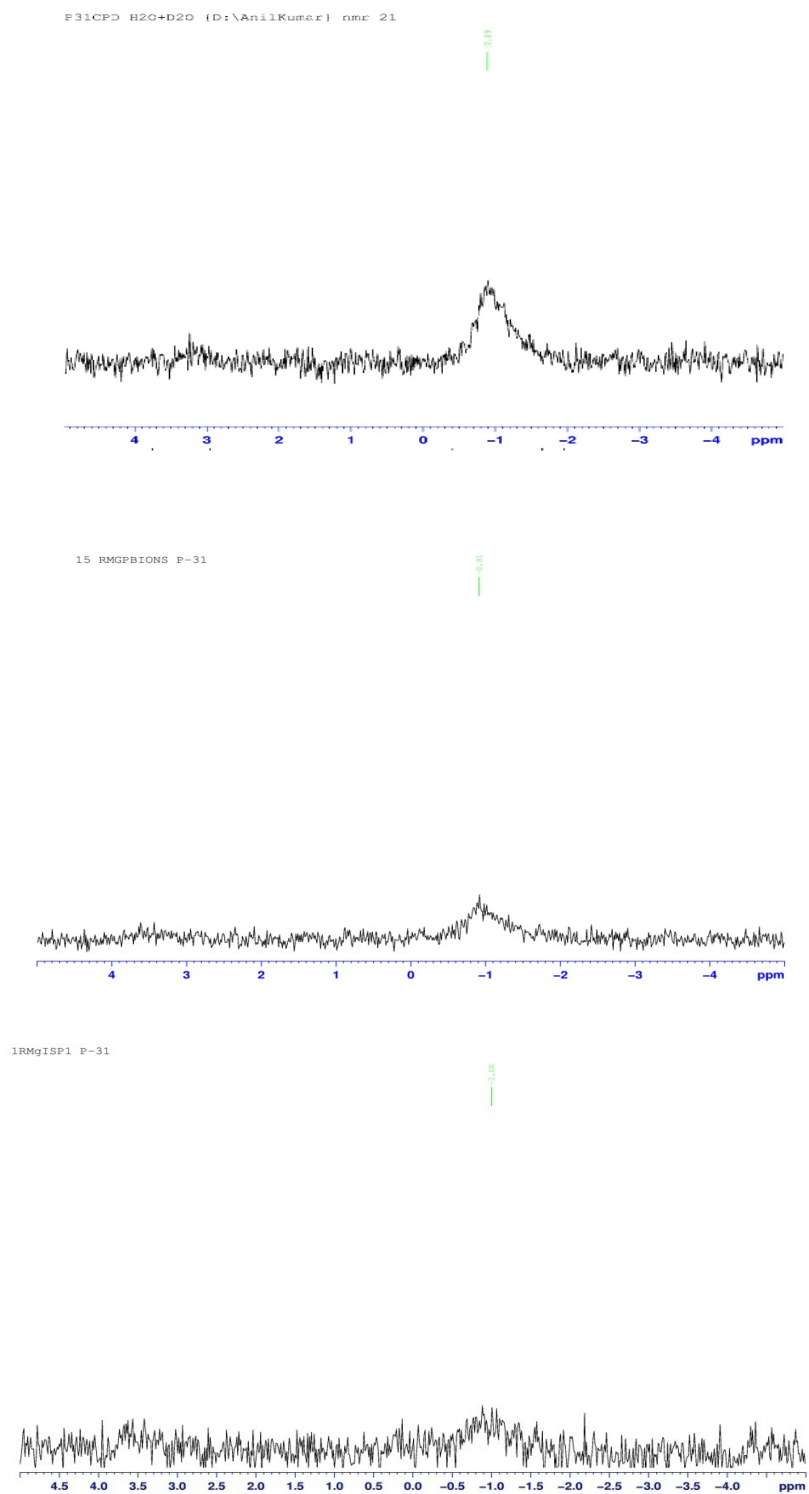


Fig. S5B ^{31}P NMR spectra of SB, SB1, and SP1 (top to bottom)

Fluorescence Decay Curves at $\lambda_{em} = 770$ nm

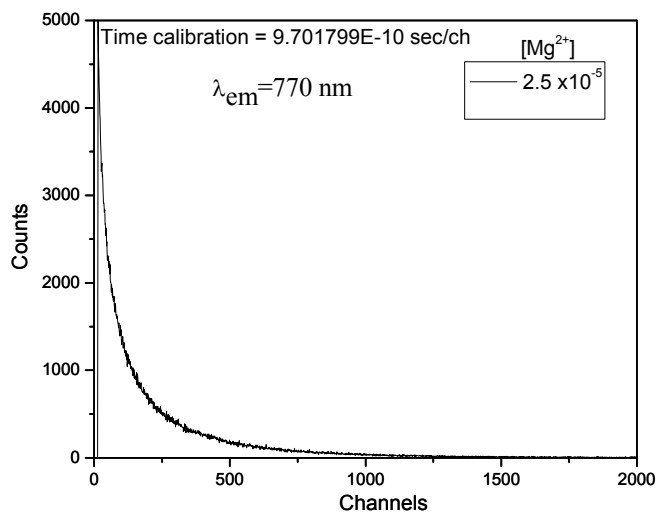


Fig.S6A

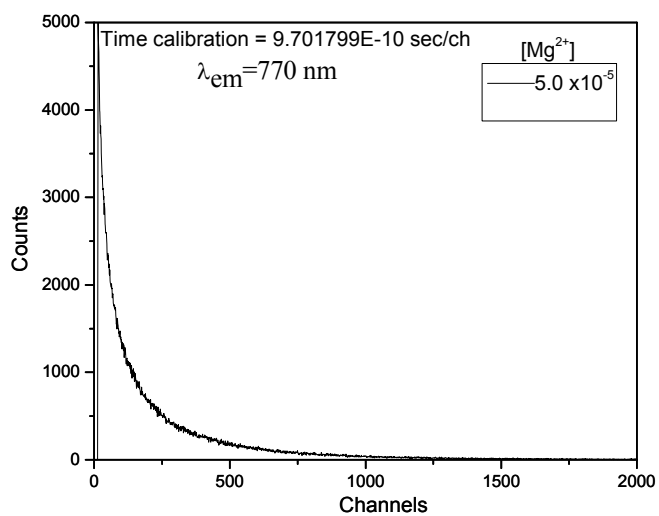


Fig.S6B

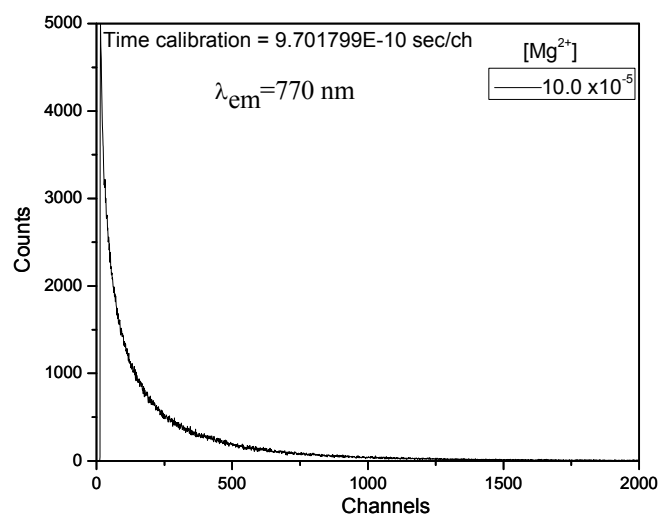


Fig.S6C

Fluorescence Decay Curves at $\lambda_{em} = 1000\text{ nm}$

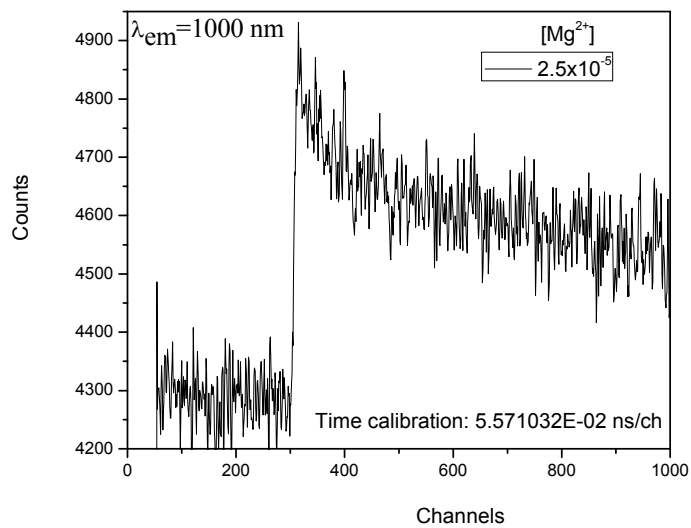


Fig.S7A

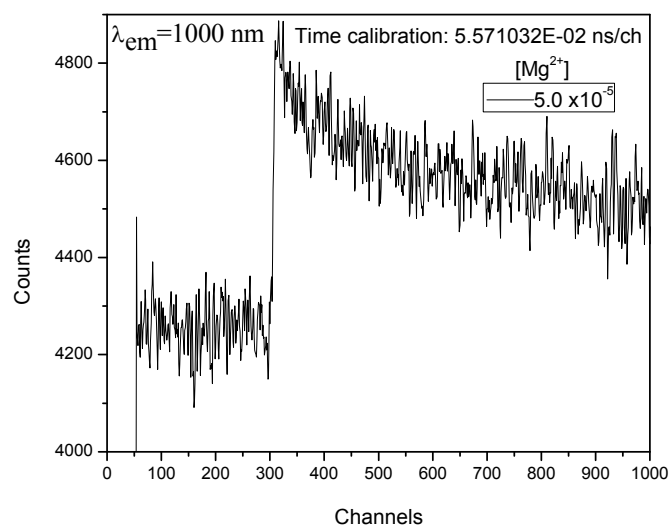


Fig.S7B

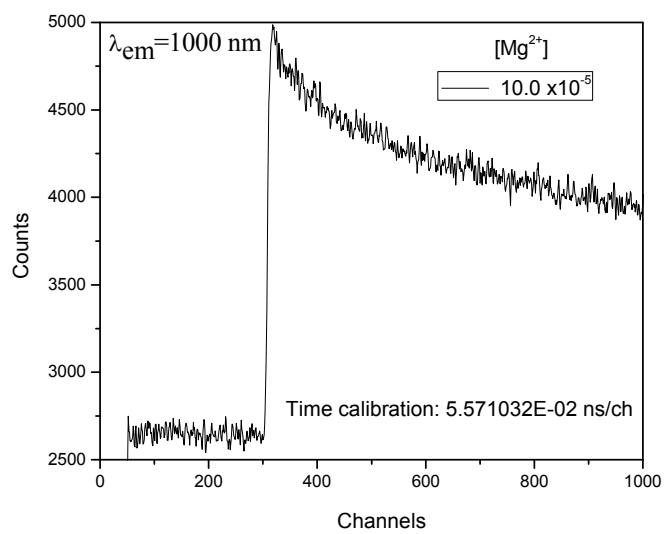


Fig.S7C

Table S1: XRD spectral data for SP1

Angle (2θ)	(<i>hkl</i>)	Lattice parameter (<i>a</i>) in Å
29.13	(200)	6.130
41.59	(220)	6.134
49.34	(311)	6.120

Table S2 IR spectral data:

Moiety (constituent) /Functional group	RNA (cm^{-1}) (SB)	Mg ²⁺ + Pb ²⁺ on RNA matrix (cm^{-1}) (SB1)	Mg ²⁺ + Pb ²⁺ / PbSe on RNA matrix (cm^{-1}) (SP1)
In plane vibrations: G&U	1693 (br)	1690 (br) Change in shape	1690 (br) Change in shape
A&C	1642 (m)	1651(s)	1651(s) Change in shape
G	1544(m)	1570(br)	1570 (s) Change in shape
U (medium)	1469(m)	1487(br)	1487 (br) Change in shape
In plane C2'-OH	1421(br)	1413(s)	1413 (s) Change in shape
Purine in anti confm.	1385(s)	1385(sh)	disappeared
Purine in syn confm.	1355 (sh)	1341 (m)	1345 (br)
C	1281 (sh)	1281 (br)	disappeared
Assym. Stretch PO ₂ ²⁻	1227 (s)	1240 (s)	1240 (m)
In Ribose vib. due to 2'-OH	996 (br)	disappeared	disappeared
RNA backbone	966 (m)	968 (br)	971 (br)

s-strong; *m*- medium; *sh*- shoulder; *br*- broad