Electronic Supplementary Information


Synthesis and characterisation of aluminophosphate-based zeotype materials

prepared with α,ω-*bis*(*N*-methylpyrrolidinium)alkane cations as structure-

directing agents

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Fig S.1. Stereoplots showing the columns of secondary building units and cavities in (a) **ERI** and (b) **AFX**. Oxygen atoms are omitted for clarity; the unit cell edges are included.


(a)

(b)
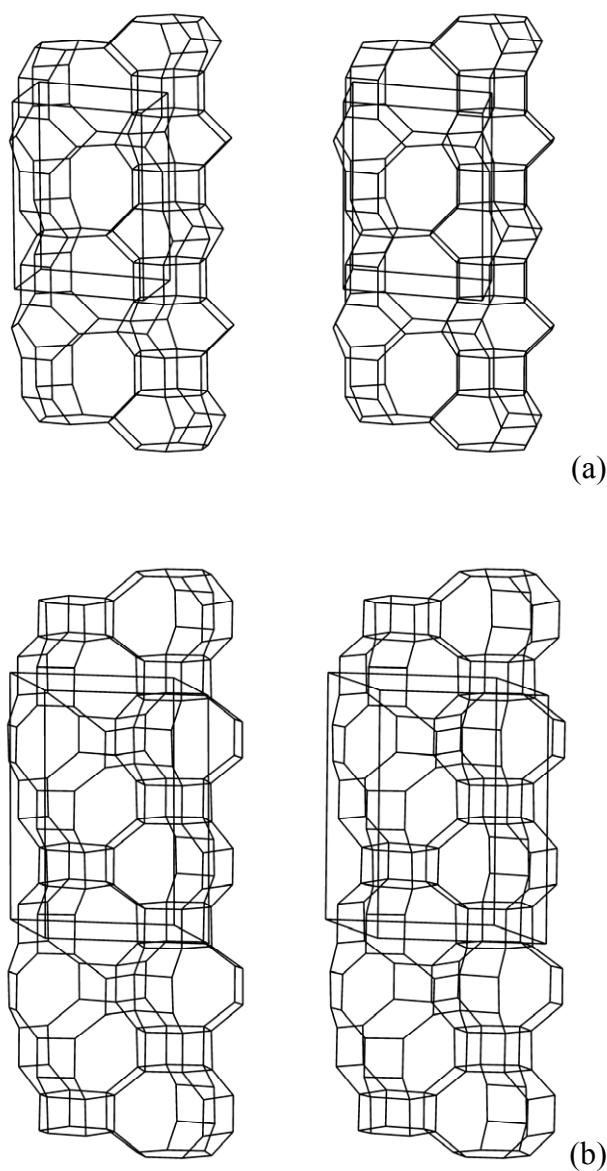
Fig S.2. FT-IR spectra of as-prepared solids templated with diquat-4, (a) $AlPO_4$–**ERI** + trace A, (b) $AlPO_4(F)$–**ERI**, (c) $Mg_{0.1}$–**ERI**, (d) $Mg_{0.15}$–**ERI**, (e) $Mg_{0.2}$–**ERI**, (f) $Mg_{0.25}$–**ERI**
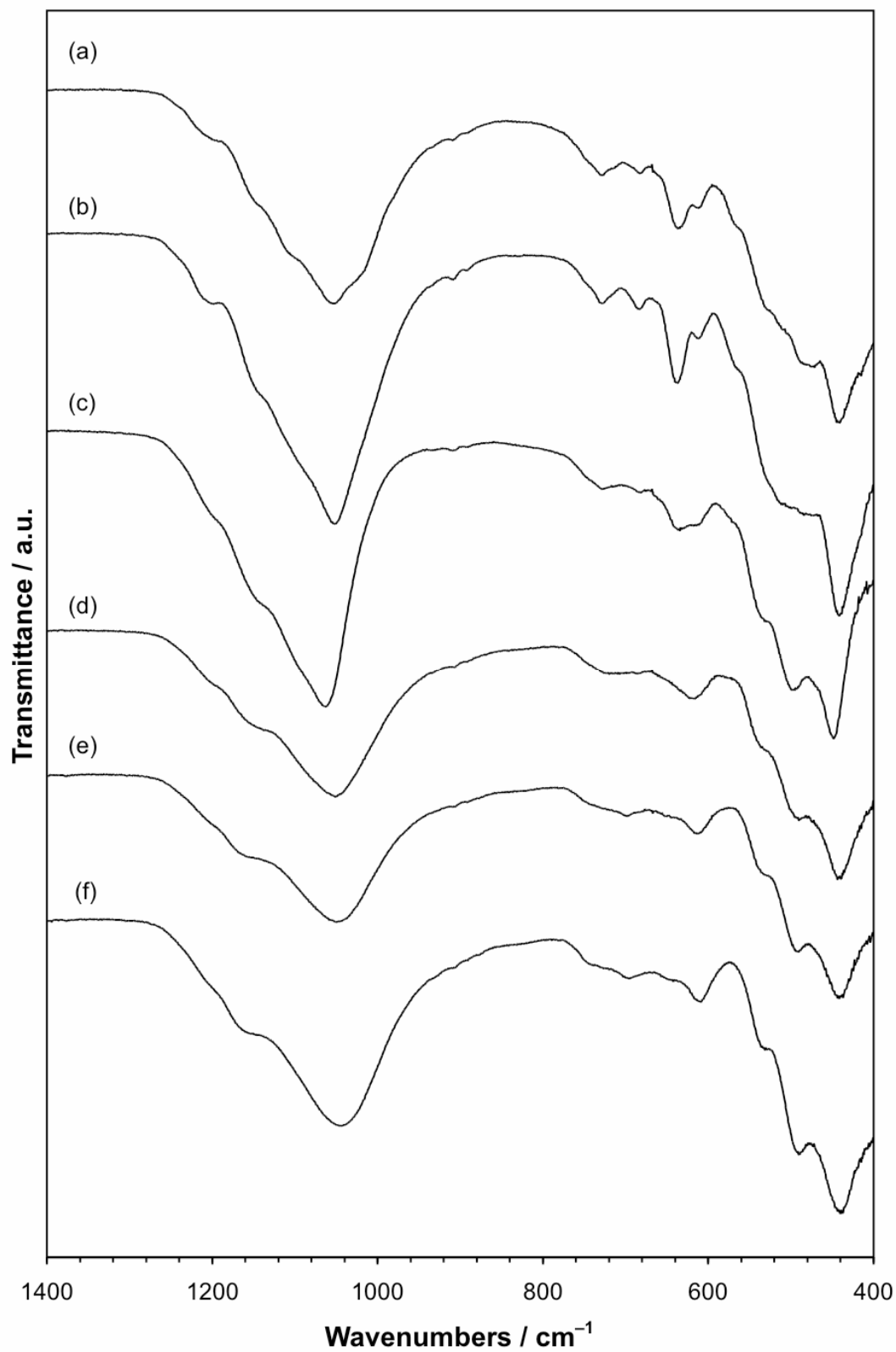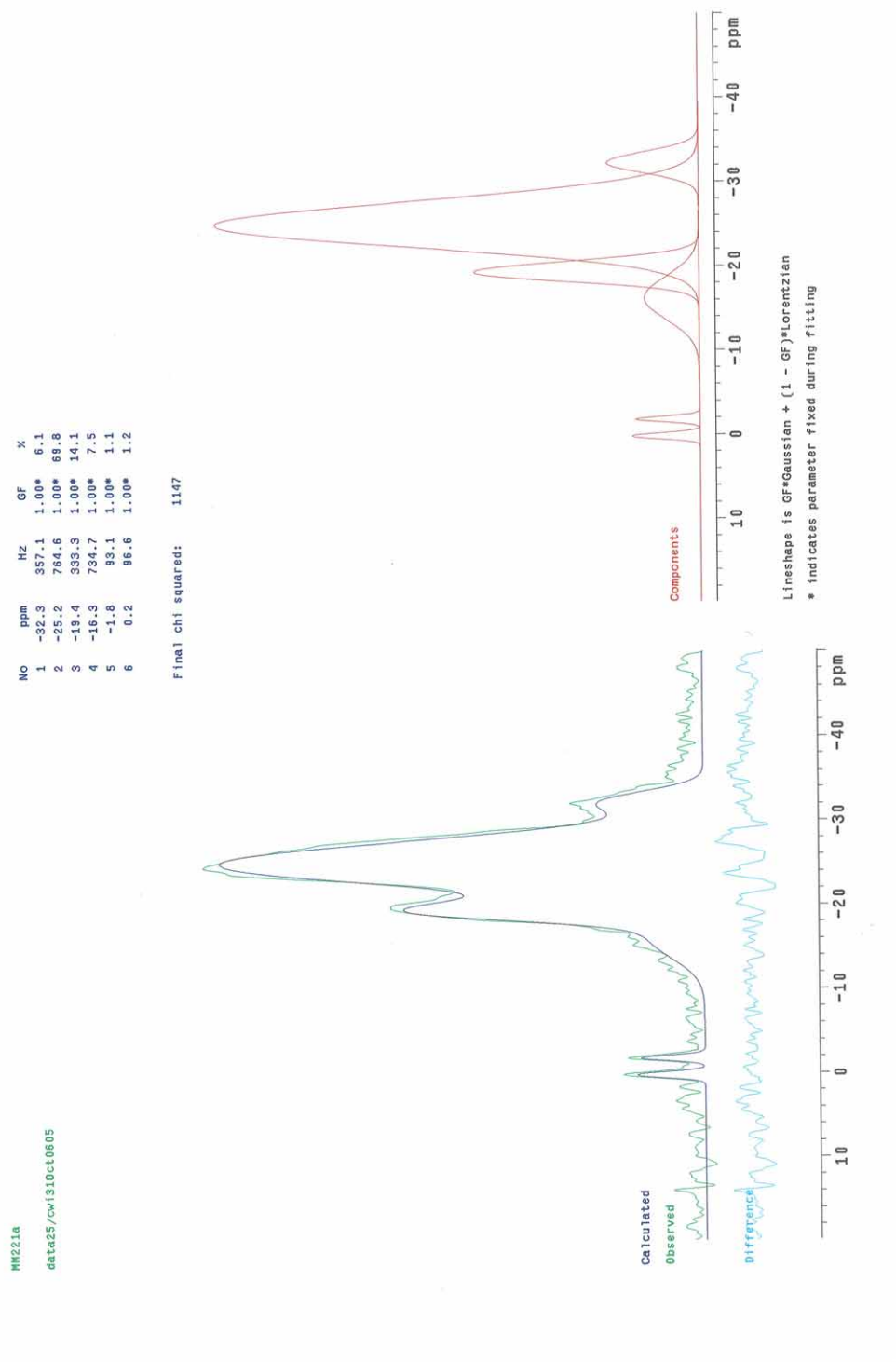
Fig S.3. FT-IR spectra of as-prepared solids templated with diquat-5, (a) phase D, (b) $AlPO_4(F)$–**AFX** and $AlPO_4(F)$–**ERI**, (c) $Mg_{0.1}$–**AFX**, (d) $Mg_{0.15}$–**AFX**, (e) $Mg_{0.2}$–**AFX**, (f) $Mg_{0.25}$–**AFX**
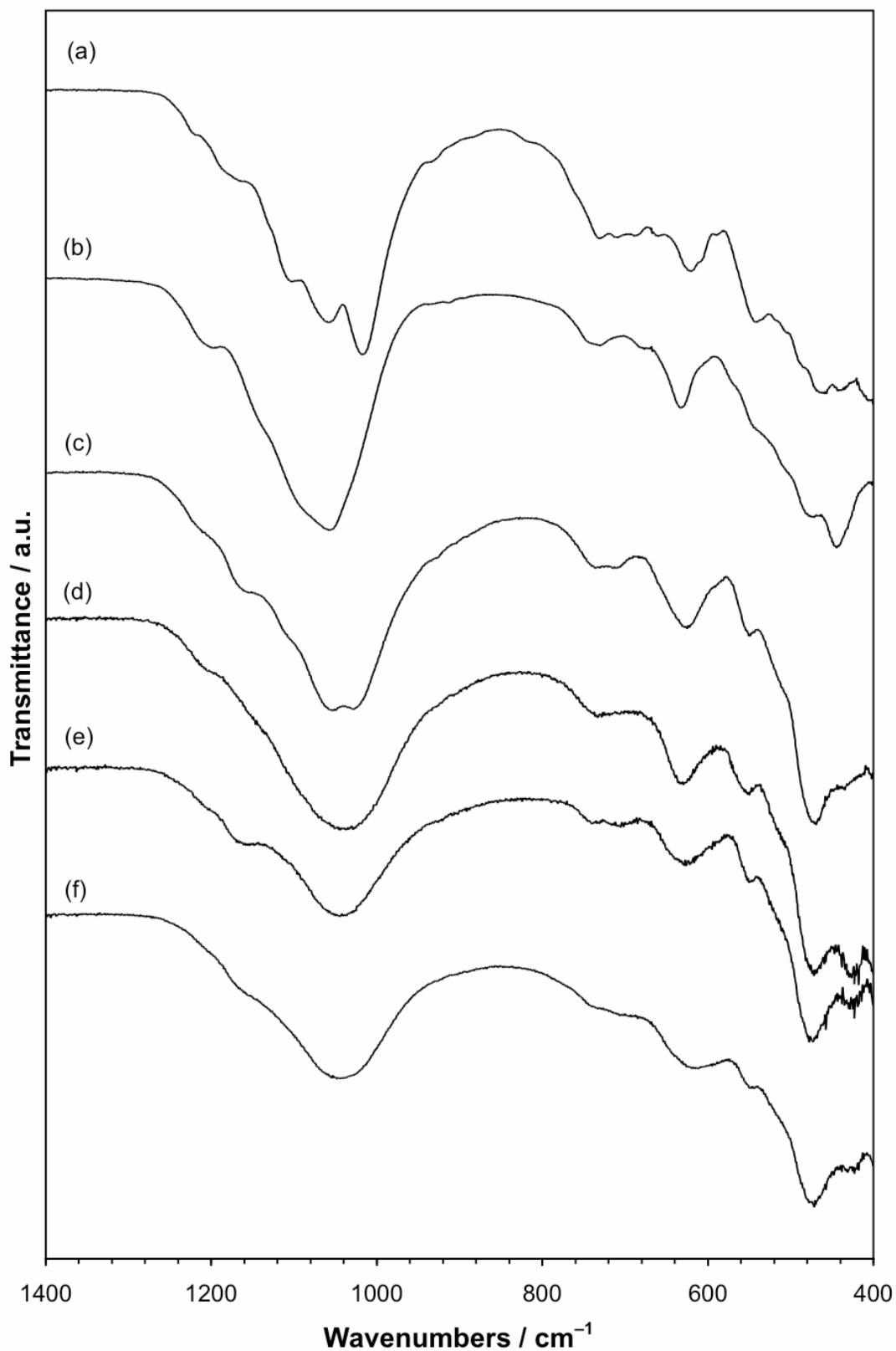
Fig S.4. Deconvoluted ^{31}P DP MAS NMR spectrum of as-prepared $Mg_{0.15}$–**ERI** templated with diquat-4.
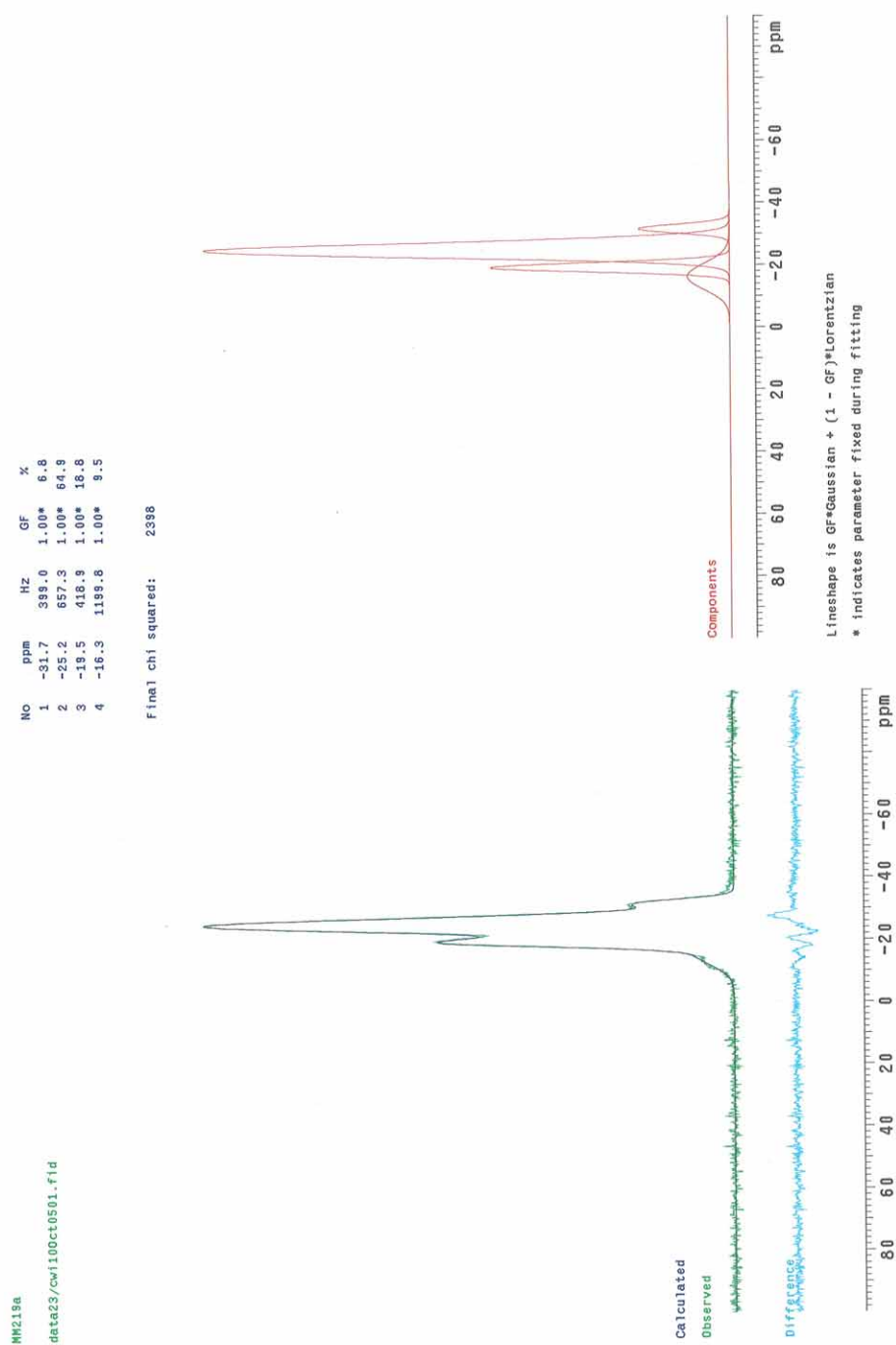
Fig S.5. Deconvoluted ^{31}P DP MAS NMR spectrum of as-prepared $Mg_{0.25}$–**ERI** templated with diquat-4.

No	ppm	Hz	GF	%
1	-32.3	357.1	1.00*	6.1
2	-25.2	764.6	1.00*	69.8
3	-19.4	333.3	1.00*	14.1
4	-16.3	734.7	1.00*	7.5
5	-1.8	93.1	1.00*	1.1
6	0.2	96.6	1.00*	1.2

Final chi squared: 1147

Lineshape is GF*Gaussian + (1 - GF)*Lorentzian

* indicates parameter fixed during fitting

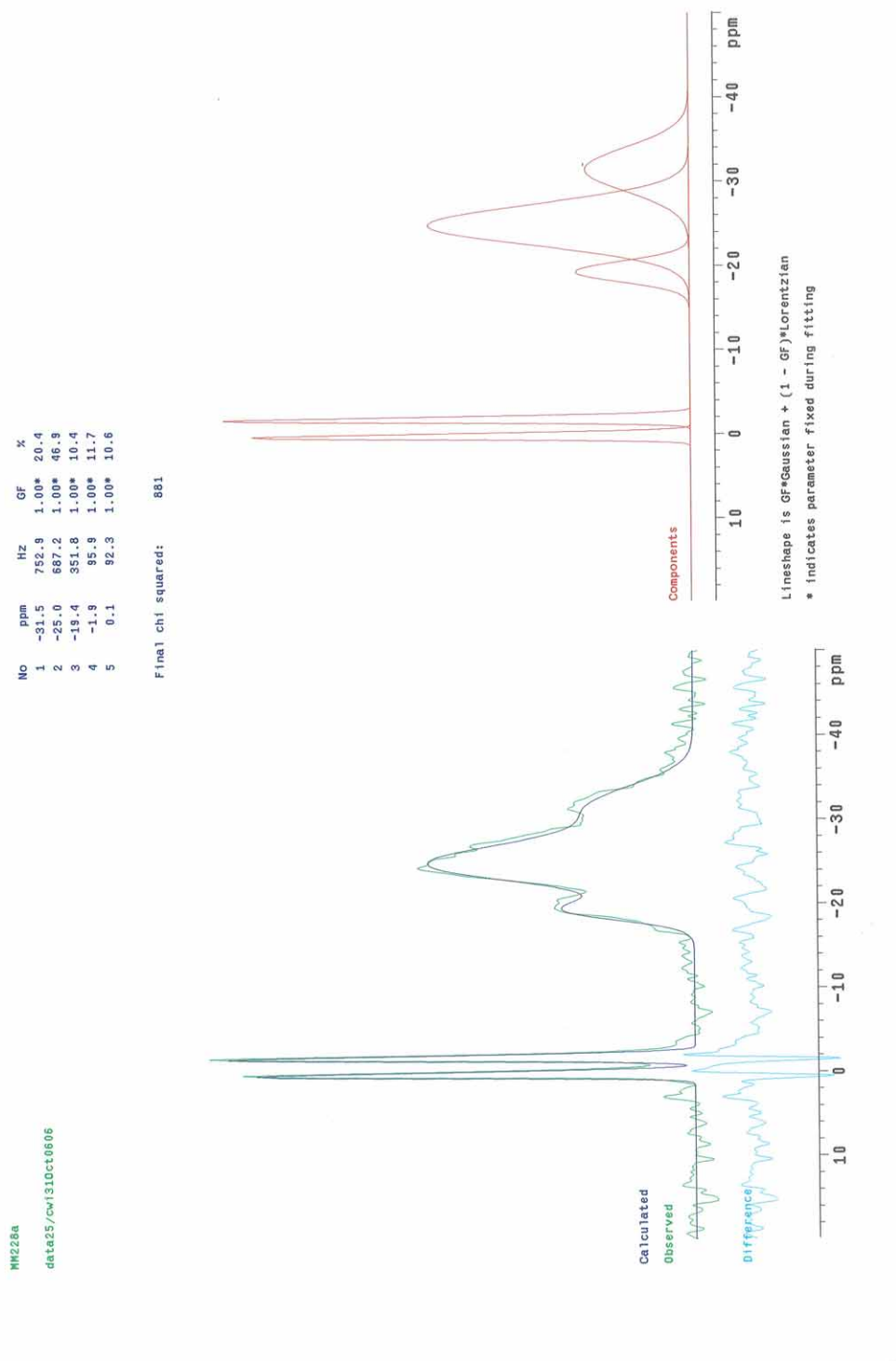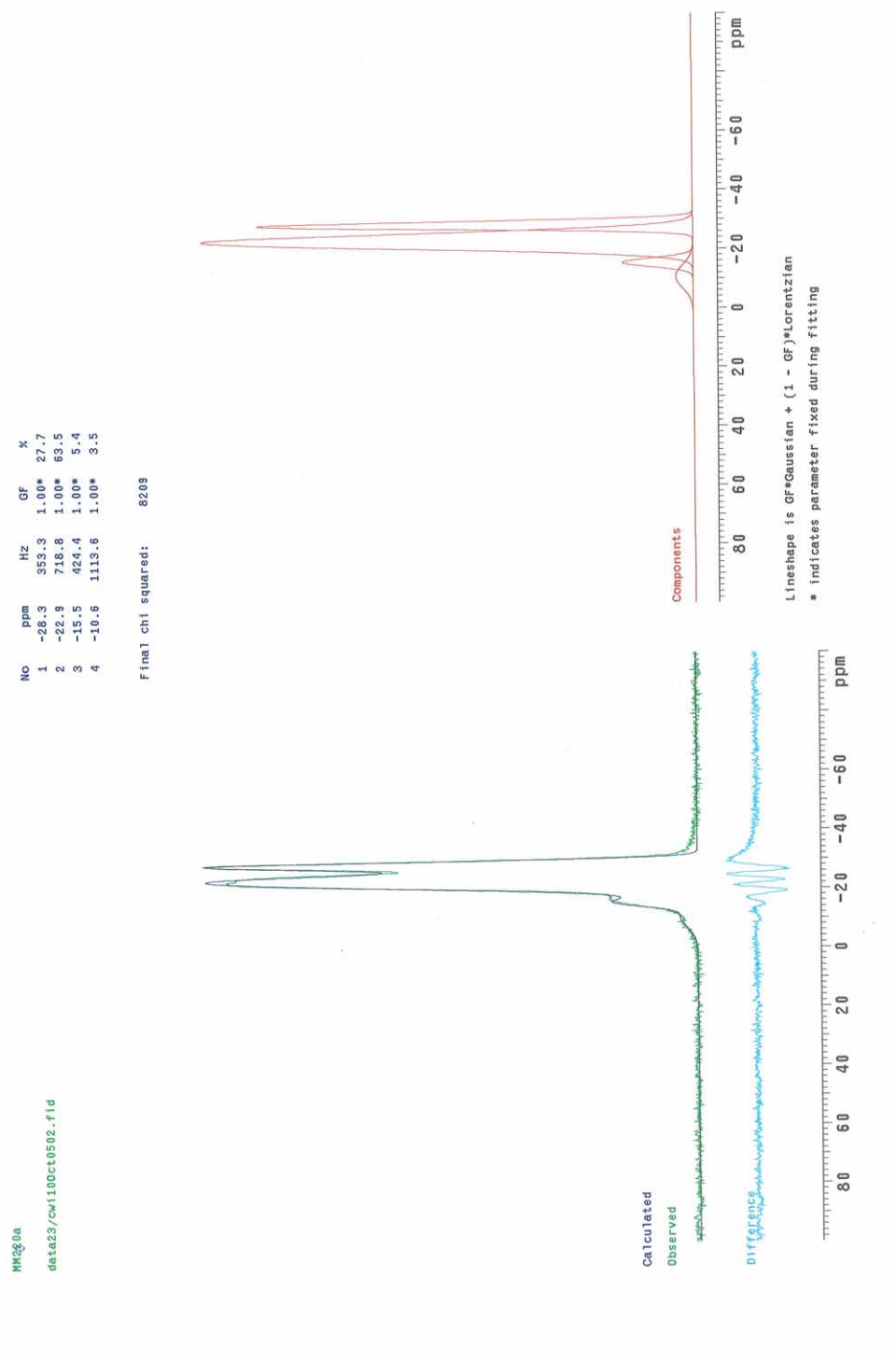Components

MM221a

data25/cwi31Oct0605

Calculated
Observed
Difference

5
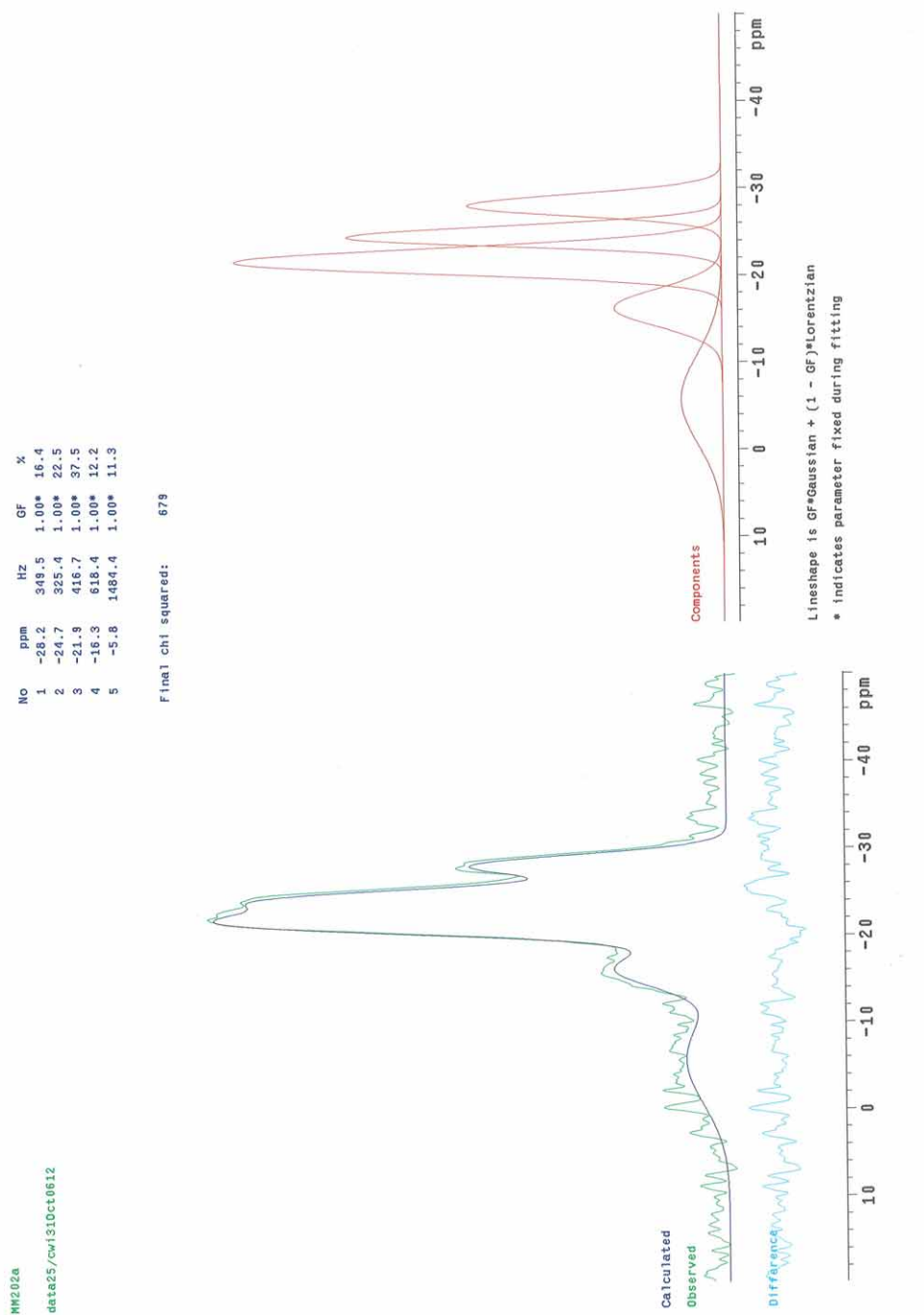
Fig S.6. Deconvoluted ^{31}P DP MAS NMR spectrum of as-prepared $Mg_{0.50}$–**ERI** + C templated with diquat-4.

Fig S.7. Deconvoluted ^{31}P DP MAS NMR spectrum of as-prepared Mg$_{0.15}$–**AFX** templated with diquat-5.

No	ppm	Hz	GF	%
1	-28.3	353.3	1.00*	27.7
2	-22.9	718.8	1.00*	63.5
3	-15.5	424.4	1.00*	5.4
4	-10.6	1113.6	1.00*	3.5

Final chi squared: 8209

Lineshape is GF*Gaussian + (1 - GF)*Lorentzian

* indicates parameter fixed during fitting

MM280a

data23/cw110ct0502.fid

Calculated

Observed

Difference

Components

7

Fig S.8. Deconvoluted ^{31}P DP MAS NMR spectrum of as-prepared Mg$_{0.25}$–**AFX** templated with diquat-5.

No	ppm	HZ	GF	X
1	-28.2	349.5	1.00*	16.4
2	-24.7	325.4	1.00*	22.5
3	-21.9	416.7	1.00*	37.5
4	-16.3	618.4	1.00*	12.2
5	-5.8	1484.4	1.00*	11.3

Final chi squared: 679

Lineshape is GF*Gaussian + (1 - GF)*Lorentzian

* indicates parameter fixed during fitting

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Fig S.9. Simulated XRD patterns of framework types (a) **AFX**, and (b) **ERI**.