Structural Investigations of the Nickel-Induced Inhibition of Truncated Constructs of the JMJD2 Family of Histone Demethylases Using X-ray Absorption Spectroscopy

*Nitai Charan Giri,[†] Lisa Passantino,[‡] Hong Sun, Maria Antonietta Zoroddu,[§] Max Costa[‡] and Michael J. Maroney[†]**

Supporting Information

Figure S1: Purification of JMJD2A using MagneGST^{TM} particles (Molecular weight markers (MW) are in kD. Lysate and flow through are indicated by L and FT respectively. Three times wash has been indicated by W1 – 3. Elution of pure protein is indicated by E1 and E2).

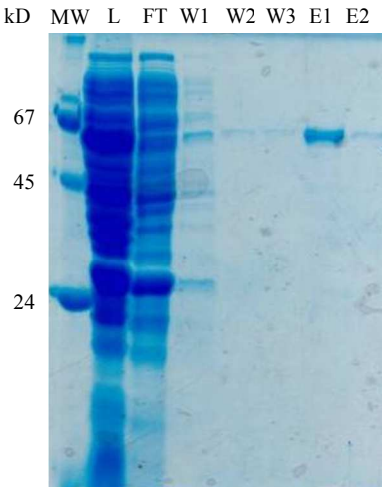

Figure S2: Cleavage of GST-tag from JMJD2A (Molecular weight markers (MW) are in kD. Cleaved and uncleaved protein are indicated by C and UC respectively).

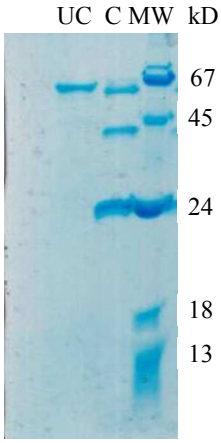

Figure S3: Purification of JMJD2A using gel-filtration column (Molecular weight (MW) markers are in kD. Different fractions are indicated by B2 – 12).

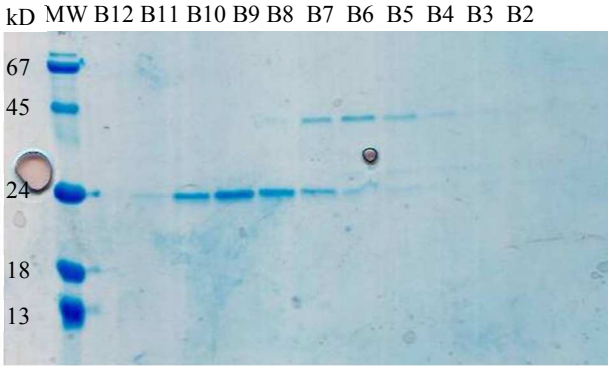

Figure S4: Activity assay of JMJD2A done by immunoblotting.

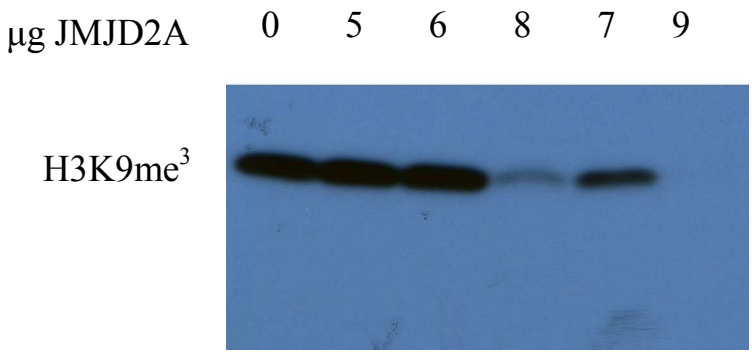

Figure S5: Purification of JMJD2C using Ni-NTA column (Molecular weight markers (MW) are in kD. Different fractions are indicated by 1 – 5).

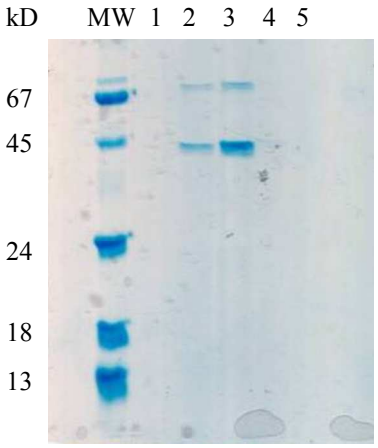

Figure S6: Purification of JMJD2C using gel-filtration column (Molecular weight markers (MW) are in kD).

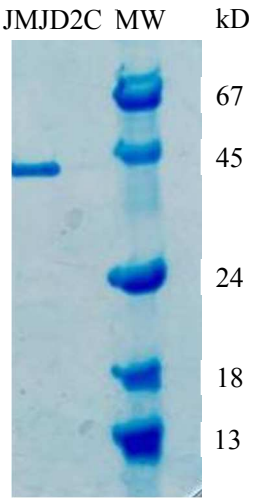

Figure S7: Cleavage of His_6-tag from JMJD2C (Molecular weight markers (MW) are in kD. Cleaved and uncleaved proteins are indicated by C and UC respectively.).

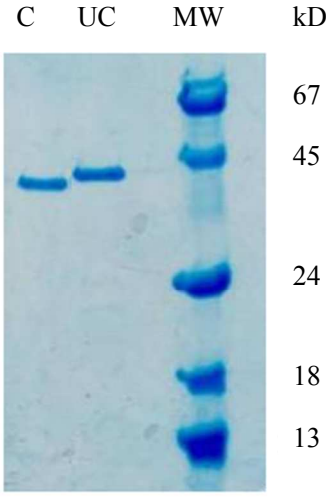

Figure S8: Activity assay of JMJD2C done by immunoblotting.

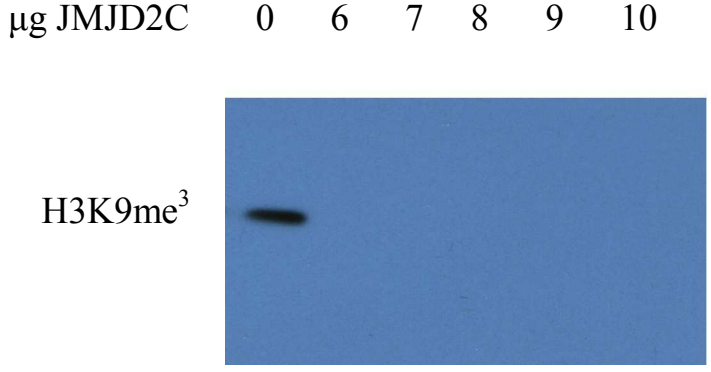

Figure S9: IC50 for the inhibition of JMJD2C by Ni(II) ions is ~ 20.54 μM. IC50 value was calculated using GraphPad Prisom 6 software (version 6.0a, July18, 2012) and a sigmoidal dose-response function.

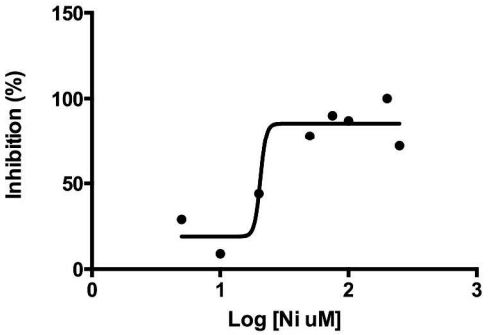

Table S1. EXAFS analysis of Fe(JMJD2A) (k = 2 – 12.5 Å^{-1} fit in r-space with values r = 1 – 4.5). Fits included in the text Table 1 are shown in **bold type**.

Shell	r(Å)	σ^2(Å^2)	ΔE_0(eV)	χ^2	Red χ^2	R
2 N/O	2.07(2)	1(1)	-9(4)	1070.82	53.37	0.2989
3 N/O	2.07(2)	4(1)	-9(3)	726.8	36.22	0.2028
4 N/O	2.07(1)	6(1)	-10(2)	573	28.55	0.1599
5 N/O	2.07(1)	7(1)	-10(2)	537.33	26.78	0.1499
6 N/O	2.07(1)	9(1)	-11(2)	574.19	28.61	0.1602
7 N/O	2.07(2)	11(1)	-12(2)	652.98	32.54	0.1822
2 S	2.16(2)	6(1)	-29(6)	1043.3	52	0.2912
3 S	2.17(2)	9(1)	-28(4)	803.58	40.05	0.2243
4 S	2.18(2)	11(1)	-28(4)	694.43	34.61	0.1938
5 S	2.18(2)	13(1)	-28(3)	654.33	32.61	0.1826
6 S	2.18(2)	15(1)	-28(3)	652.77	32.53	0.1822
7 S	2.18(2)	17(1)	-28(2)	673.11	33.54	0.1878
2 N/O	2.04(2)	1(3)				
1 N/O	2.16(5)	0(5)	-9(3)	657.31	36.38	0.1834
2 N/O	2.03(2)	0(2)				
2 N/O	2.16(2)	2(3)	-8(2)	505.04	27.95	0.1409
3 N/O	2.05(2)	2(1)				
1 N/O	2.19(3)	0(3)	-9(2)	508.76	28.16	0.142
4 N/O	2.07(2)	4(1)				
1 N/O	2.22(4)	1(3)	-8(2)	496.55	27.48	0.1386
3 N/O	2.04(2)	3(2)				
2 N/O	2.19(3)	4(4)	-8(2)	485.91	26.9	0.1356
5 N/O	2.07(2)	7(1)				
1 N/O	2.55(3)	1(3)	-11(2)	502.61	27.82	0.1403
4 N/O	2.07(2)	6(1)				

2 N/O	2.2(2)	26(33)	-9(4)	549.61	30.42	0.1534
3 N/O	2.06(2)	5(2)				
3 N/O	2.1(1)	18(11)	-9(3)	553.22	30.62	0.1544
6 N/O	2.07(2)	9(1)				
1 N/O	2.54(3)	1(3)	-12(2)	510.33	28.25	0.1424
5 N/O	2.08(2)	7(1)				
2 N/O	2.4(2)	38(60)	-9(3)	550.78	30.49	0.1537
4 N/O	2.08(2)	6(1)				
3 N/O	2.2(3)	44(58)	-9(6)	563.48	31.19	0.1572
2 S	2.16(2)	6(1)				
1 S	4.4(1)	5(12)	-29(6)	1012.63	56.05	0.2826
2 S	2.15(2)	4(1)				
2 S	2.30(3)	6(2)	-23(3)	577.55	31.97	0.1612
3 S	No fit					
1 S						
4 S	No fit					
1 S						
3 S	2.16(4)	9(1)				
2 S	1.0(1)	62(29)	-32(10)	615.72	34.08	0.1718
5 S	No fit					
1 S						
4 S	2.17(2)	11(1)				
2 S	9(3)	0(245)	-28(4)	694.26	38.43	0.1938
3 S	2.16(2)	8(2)				
3 S	2.31(4)	13(4)	-23(4)	577.94	31.99	0.1613
6 S	No fit					
1 S						
5 S	2.18(2)	13(1)				
2 S	5.2(1)	4(13)	-28(4)	643.33	35.61	0.1795
4 S	2.18(2)	11(2)				
3 S	2.35(6)	17(8)	-23(4)	595.47	32.96	0.1662

2 N/O 1 S	2.03(2) 2.30(3)	1(1) 5(3)	-13(3)	606.88	33.59	0.1694
1 N/O 2 S	1.42(5) 2.17(3)	8(6) 6(1)	-28(6)	948.91	52.53	0.2648
2 N/O 2 S	2.03(2) 2.28(4)	2(1) 12(3)	-15(3)	565.63	31.31	0.1578
3 N/O 1 S	2.04(2) 2.32(4)	4(1) 8(4)	-12(3)	523.93	29	0.1462
1 N/O 3 S	2.51(3) 2.16(2)	0(2) 8(1)	-29(3)	604.73	33.47	0.1688
1 N/O 4 S	No fit					
4 N/O 1 S	2.09(2) 1.82(6)	7(2) 25(12)	-7(2)	508.71	28.16	0.142
2 N/O 3 S	1.0(9) 2.17(3)	78(376) 9(1)	-28(5)	799.33	44.25	0.2231
3 N/O 2 S	2.04(2) 2.29(5)	5(1) 16(5)	-14(3)	537.88	29.77	0.1501
5 N/O 1 S	2.08(2) 1.88(8)	8(2) 30(26)	-8(3)	522.56	28.92	0.1458
1 N/O 5 S	No fit					
4 N/O 2 S	2.08(2) 2.5(2)	6(1) 40(30)	-9(2)	527.15	29.18	0.1471
2 N/O 4 S	1.55(7) 2.6(1)	24(12) 49(31)	7(4)	2282.86	126.38	0.6372
3 N/O 3 S	2.05(2) 2.27(6)	5(2) 22(6)	-15(4)	542.05	30	0.1513
6 N/O 1 S	2.07(2) 2.0(2)	9(2) 29(32)	-10(3)	544.65	30.15	0.152

1 N/O 6 S	2.10(2) 1.85(3)	0(2) 43(4)	2(2)	654.71	36.24	0.1827
5 N/O 2 S	2.09(1) 2.68(3)	8(1) 15(4)	-7(2)	467.35	25.87	0.1304
2 N/O 5 S	2.12(8) 2.18(2)	8(5) 13(1)	-28(4)	674.39	37.33	0.1882
4 N/O 3 S	2.08(1) 2.5(1)	6(1) 44(24)	-9(2)	517.83	28.66	0.1445
3 N/O 4 S	0.9(4) 2.17(2)	83(369) 11(1)	-28(5)	690.33	38.21	0.1927
3 N/O 1 N/O (1 Im)	2.00(3) 2.13(2)	0(3) 4(3)	-8(3)	175.41	19.57	0.0368
2 N/O 2 N/O (2 Im)	2.03(2) 2.16(2)	0(1) 1(2)	-8(2)	138.21	15.42	0.0376
1 N/O 3 N/O (3 Im)	2.05(2) 2.19(3)	2(1) 0(3)	-10(3)	163.76	18.27	0.0447
4 N/O 1 N/O (1 Im)	2.00(4) 2.12(3)	2(3) 7(3)	-9(3)	147.62	16.47	0.0402
3 N/O 2 N/O (2 Im)	**2.00(2) 2.16(2)**	**2(2) 5(2)**	**-9(2)**	**83.12**	**9.27**	**0.0227**
2 N/O 3 N/O (3 Im)	2.03(1) 2.17(2)	3(1) 3(2)	-10(2)	102.25	11.41	0.0278
5 N/O 1 N/O (1 Im)	2.06(5) 2.09(6)	3(4) 12(3)	-10(5)	149.53	16.68	0.0314
4 N/O 2 N/O (2 Im)	2.01(3) 2.16(5)	4(2) 11(5)	-10(3)	127.88	14.27	0.0348

3 N/O 3 N/O (3 Im)	2.02(2) 2.17(4)	5(2) 8(5)	-10(3)	107.96	12.04	0.0294
6 N/O 1 N/O (1 Im)	2.06(3) 2.07(5)	2(2) 15(2)	-12(4)	182.05	20.31	0.0382
5 N/O 2 N/O (2 Im)	2.06(2) 2.10(8)	4(2) 18(4)	-11(5)	153.59	17.14	0.0418
4 N/O 3 N/O (3 Im)	2.06(1) 2.1(1)	6(1) 20(7)	-11(5)	122.35	13.65	0.0333
4 N/O (1 Im)	2.07(1)	6(1)	-10(2)	219.72	20.04	0.0598
4 N/O (2 Im)	2.07(1)	6(1)	-11(2)	202.97	18.51	0.0553
4 N/O (3 Im)	2.06(1)	6(1)	-12(2)	208.26	19	0.0567
5 N/O (1 Im)	2.07(1)	8(1)	-11(1)	165.9	15.13	0.0452
5 N/O (2 Im)	2.07(1)	8(1)	-11(2)	135.94	12.4	0.037
5 N/O (3 Im)	2.07(1)	8(1)	-12(2)	131.71	12.01	0.0358
6 N/O (1 Im)	2.07(1)	10(1)	-11(2)	185.43	16.91	0.0505
6 N/O (2 Im)	2.07(1)	9(1)	-11(2)	133.42	12.17	0.0363
6 N/O (3 Im)	2.07(1)	9(1)	-12(2)	162.78	14.85	0.044
7 N/O (1 Im)	2.08(2)	11(1)	-11(2)	239.09	21.18	0.0651

7 N/O (2 Im)	2.08(2)	11(1)	-12(2)	170.46	15.55	0.0464
7 N/O (3 Im)	2.07(1)	11(1)	-12(2)	142.33	12.98	0.0387
3 N/O	2.0(1)	2(8)				
2 N/O (2 Im)	2.1(1)	10(28)	-9(5)	113.28	16.27	0.0308
1 O	2.03(2)	0(17)				
1 O	2.14(2)					
1 C	2.81(2)					
1 C	2.94(2)					
2 N/O	2.0(1)	4(8)				
3 N/O (3 Im)	2.1(2)	7(9)	-9(4)	120.65	17.33	0.0328
1 O	2.00(2)	0(12)				
1 O	2.11(2)					
1 C	2.78(2)					
1 C	2.77(2)					
3 N/O	2.04(4)	4(4)	-10(3)	121.1	17.4	0.0338
3 N/O (3 Im)	2.17(6)	9(24)				
1 O	1.77(2)	8(20)				
1 O	1.88(2)					
1 C	2.55(2)					
1 C	2.64(2)					
5 N/O (2 Im)	2.08(1)	8(2)	-10(3)	128.7	14.36	0.035
1 O	1.99(1)	23(34)				
1 O	2.10(1)					
1 C	2.77(1)					
1 C	2.86(1)					
5 N/O (3 Im)	2.07(2)	8(1)	-12(3)	117.56	13.12	0.032
1 O	1.98(2)	27(17)				
1 O	1.89(2)					
1 C	2.67(2)					
1 C	2.76(2)					
6 N/O	2.06(2)	6(3)	-10(2)	116.74	13.03	0.0318

(2 Im)						
1 O	2.02(4)	0(5)				
1 O	2.13(4)					
1 C	2.80(4)					
1 C	2.89(4)					
7 N/O	2.08(2)	7(2)	-10(2)	112.17	12.51	0.0305
(3 Im)						
1 O	1.98(4)	1(4)				
1 O	2.09(4)					
1 C	2.76(4)					
1 C	2.85(4)					

Table S2. EXAFS analysis of Fe(JMJD2A)-αKG (k = 2 – 12 Å^{-1} fit in r-space with values r = 1 – 4.5). Fits included in the text Table 1 are shown in **bold type**.

Shell	r(Å)	σ^2(Å^2)	ΔE_0(eV)	χ^2	Red χ^2	R
2 N/O	2.08(2)	0(1)	-5(5)	274.3	14.46	0.2958
3 N/O	2.07(2)	1(1)	-7(3)	202.84	10.69	0.2187
4 N/O	2.07(2)	3(1)	-8(3)	180.17	9.5	0.1943
5 N/O	2.06(2)	5(1)	-9(3)	178.78	9.42	0.1928
6 N/O	2.06(2)	7(1)	-10(3)	189.12	9.97	0.2039
7 N/O	2.05(2)	8(1)	-12(3)	205.8	10.85	0.2219
2 S	2.17(2)	4(1)	-25(5)	217.44	11.46	0.2345
3 S	2.16(2)	7(1)	-27(4)	187.62	9.89	0.2023
4 S	2.16(2)	9(1)	-28(4)	181.48	9.57	0.1957
5 S	2.15(2)	11(1)	-29(4)	185.62	9.79	0.2001
6 S	2.15(2)	13(1)	-31(4)	194.57	10.26	0.2098
7 S	2.15(3)	14(1)	-32(5)	205.77	10.85	0.2219
2 N/O 1 N/O	2.1(2) 2.1(3)	2(17) 0(11)	-7(5)	199.53	11.76	0.2151
2 N/O 2 N/O	2.12(4) 1.97(7)	0(4) 4(9)	-10(4)	162.69	9.59	0.1754
3 N/O 1 N/O	2.08(2) 1.94(5)	0(2) 0(5)	-10(3)	155.59	9.17	0.1678
4 N/O 1 N/O	2.08(2) 2.40(5)	3(1) 3(6)	-6(3)	166.75	9.83	0.1798
3 N/O 2 N/O	2.09(2) 1.94(3)	2(2) 4(4)	-12(3)	139.66	8.23	0.1506
5 N/O 1 N/O	2.08(2) 2.40(3)	6(1) 0(3)	-7(3)	149.41	8.81	0.1611

4 N/O	2.09(2)	3(1)				
2 N/O	2.38(7)	13(12)	-5(3)	166.98	9.84	0.18
3 N/O	2.09(2)	2(2)				
3 N/O	1.93(3)	4(3)	-15(3)	142.23	8.38	0.1533
6 N/O	2.08(2)	7(1)				
1 N/O	2.39(3)	0(3)	-9(3)	144.45	8.51	0.1557
5 N/O	2.09(2)	5(1)				
2 N/O	2.40(4)	7(6)	-6(3)	152.56	8.99	0.1645
4 N/O	2.09(2)	3(1)				
3 N/O	2.37(7)	19(13)	-4(3)	164.89	9.72	0.1778
2 S	2.15(2)	1(1)				
1 S	2.01(3)	1(2)	-35(5)	153.08	9.02	0.165
2 S	2.16(2)	1(1)				
2 S	2.02(3)	4(2)	-38(5)	137.11	8.08	0.1478
3 S	2.17(2)	7(1)				
1 S	1.65(6)	14(5)	-26(5)	154.24	9.09	0.1663
4 S	2.17(3)	9(1)				
1 S	0.3(1)	62(30)	-26(5)	177.42	10.46	0.1913
3 S	2.17(2)	7(1)				
2 S	2.97(3)	8(3)	-24(4)	135.24	7.97	0.1458
5 S	2.16(3)	11(1)				
1 S	0.3(1)	81(65)	-28(6)	183.93	10.84	0.1983
4 S	2.17(3)	9(1)				
2 S	1.7(1)	32(16)	-26(7)	174.31	10.27	0.1879
3 S	2.17(3)	7(1)				
3 S	1.7(1)	32(9)	-24(7)	164.43	9.69	0.1773
6 S	No fit					
1 S						
5 S	2.20(2)	9(1)				
2 S	2.45(3)	9(4)	-21(4)	149.15	8.79	0.1608

4 S	2.19(2)	8(1)				
3 S	2.43(4)	15(6)	-19(4)	151.31	8.92	0.1631
2 N/O	1.92(4)	3(3)				
1 S	2.18(2)	0(1)	-26(6)	159.65	9.41	0.1721
1 N/O	1.49(3)	5(3)				
2 S	2.18(2)	4(1)	-23(5)	167.69	9.88	0.1808
2 N/O	1.86(3)	3(2)				
2 S	2.16(2)	3(1)	-31(4)	133.64	7.88	0.1441
3 N/O	1.94(4)	6(3)				
1 S	2.19(2)	0(1)	-24(5)	139.16	8.2	0.15
1 N/O	2.7(1)	8(19)				
3 S	2.17(2)	7(1)	-26(5)	175.95	10.37	0.1897
1 N/O	No fit					
4 S						
4 N/O	1.93(4)	8(3)				
1 S	2.18(2)	0(1)	-26(5)	133.09	7.84	0.1435
2 N/O	4.6(1)	2(13)				
3 S	2.16(2)	7(1)	-27(5)	184.03	10.85	0.1984
3 N/O	1.87(3)	6(2)				
2 S	2.16(2)	3(1)	-32(5)	134.6	7.93	0.1451
5 N/O	2.07(2)	6(2)				
1 S	1.8(1)	32(39)	-8(4)	172.62	10.17	0.1861
1 N/O	No fit					
5 S						
4 N/O	2.08(6)	5(7)				
2 S	2.17(5)	9(13)	-15(4)	172.22	10.15	0.1857
2 N/O	0.71(3)	2(5)				
4 S	2.16(2)	9(1)	-28(4)	174.63	10.29	0.1883
3 N/O	1.83(3)	7(3)				
3 S	2.15(2)	5(1)	-34(5)	146.94	8.66	0.1584

6 N/O 1 S	2.07(2) 1.26(5)	7(1) 17(8)	-8(3)	163.62	9.64	0.1764
1 N/O 6 S	3.7(1) 2.15(3)	0(10) 13(1)	-31(5)	192.15	11.32	0.2072
5 N/O 2 S	2.1(1) 2.14(8)	4(4) 8(16)	-13(5)	161.97	9.55	0.1746
2 N/O 5 S	1.48(9) 2.16(3)	18(13) 11(1)	-27(5)	181	10.67	0.1952
4 N/O 3 S	2.08(7) 2.15(4)	5(4) 11(10)	-19(4)	171.76	10.12	0.1852
3 N/O 4 S	2.30(3) 2.03(6)	0(1) 14(2)	-52(9)	149.45	8.81	0.1611
4 N/O 2 N/O (2 Im)	2.07(3) 2.2(3)	4(1) 33(126)	-8(9)	108.11	12.06	0.1166
6 N/O (2 Im)	2.06(2)	7(1)	-10(3)	127.48	11.63	0.1374
3 N/O 2 N/O (2 Im)	**2.09(2) 1.93(4)**	**2(2) 4(4)**	**-12(4)**	**70.68**	**7.88**	**0.0762**
5 N/O (2 Im)	2.07(2)	5(1)	-8(3)	130.85	11.93	0.1411
5 N/O 2 N/O (2 Im)	2.05(2) 1.88(3)	3(2) 2(2)	-17(3)	81.73	9.12	0.0881
7 N/O (2 Im)	2.06(2)	9(1)	-11(3)	133.75	12.2	0.1442
4 N/O 1 N/O (1 Im)	2.08(3) 1.0(2)	3(5) 5(21)	-9(4)	106.97	11.9	0.1153
6 N/O (1 Im)	2.06(2)	7(1)	-10(3)	134.4	12.26	0.1449

5 N/O 1 N/O (1 Im)	2.06(2) 1.88(4)	3(1) 0(3)	-13(3)	91.71	10.23	0.0989
5 N/O (1 Im)	2.06(2)	5(1)	-9(3)	122.06	11.13	0.1316
6 N/O 1N/O (1 Im)	2.06(2) 2.0(6)	7(3) 25(151)	-11(7)	134.02	14.95	0.1445
7 N/O (1 Im)	2.06(2)	9(2)	-11(3)	143.24	13.06	0.1544
3 N/O 3 N/O (3 Im)	2.08(2) 1.94(3)	2(2) 4(3)	-15(3)	82.04	9.15	0.0884
6 N/O (3 Im)	2.06(2)	7(1)	-11(3)	114.65	10.46	0.1236
2 N/O 3 N/O (3 Im)	2.09(3) 1.99(4)	3(3) 5(5)	-12(4)	79.07	8.82	0.0852
5 N/O (3 Im)	2.06(2)	5(1)	-10(3)	113.85	10.38	0.1227
4 N/O 3N/O (3 Im)	2.06(5) 2.2(8)	4(1) 44(207)	-9(18)	113.52	12.67	0.1224
7 N/O (3 Im)	2.05(2)	9(1)	-12(3)	132.97	12.13	0.1434
3 N/O **(2 Im)** **1 O** **1 O** **1 C** **1 C**	**2.05(2)** **1.90(3)** **2.11(3)** **2.62(3)** **2.72(3)**	**1(1)** **2(2)**	**0(4)**	**45.96**	**4.03**	**0.0495**
2 N/O 1 N/O (2 Im) 1 O	2.06(8) 2.1(2) 1.89(5)	3(1) 0(5) 6(6)	-2(7)	70	10.05	0.0755

1 O	2.10(5)					
1 C	2.61(5)					
1 C	2.71(5)					
5 N/O	2.07(3)	4(1)	4(6)	112.13	12.51	0.1209
(2 Im)						
1 O	2.0(2)	11(15)				
1 O	2.2(2)					
1 C	2.7(2)					
1 C	2.8(2)					
4 N/O	2.05(3)	2(2)	0(8)	70.26	10.09	0.0757
1 N/O	1.8(4)	26(64)				
(2 Im)						
1 O	1.91(3)	3(3)				
1 O	2.12(3)					
1 C	2.63(3)					
1 C	2.73(3)					
3 N/O	2.1(1)	10(1)	-3(6)	85.51	12.28	0.0922
2 N/O	2.07(6)	4(4)				
(2 Im)						
1 O	1.89(8)	6(6)				
1 O	2.10(8)					
1 C	2.61(8)					
1 C	2.71(8)					
3 N/O	2.08(3)	1(1)	5(6)	99.08	11.05	0.1068
(3 Im)						
1 O	2.0(1)	9(6)				
1 O	2.2(1)					
1 C	2.7(1)					
1 C	2.8(1)					
2 N/O	2.05(8)	2(1)	-3(5)	71.21	10.24	0.0768
1 N/O	2.1(2)	0(3)				
(3 Im)						
1 O	1.89(4)	5(5)				
1 O	2.10(4)					
1 C	2.61(4)					
1 C	2.71(4)					
5 N/O	2.07(2)	5(2)	4(5)	105.38	11.76	0.1136
(3 Im)						
1 O	1.8(1)	10(31)				
1 O	2.1(1)					

1 C	2.6(1)
1 C	2.7(1)

Table S3. EXAFS analysis of Fe(JMJD2A)-αKG + substrate (k = 2 – 12.5 Å^{-1} fit in r-space with values r = 1 – 4.5). Fits included in the text Table 1 are shown in **bold type**.

Shell	r(Å)	σ^2(Å^2)	ΔE_0(eV)	χ^2	Red χ^2	R
2 N/O	2.03(2)	3(2)	-8(4)	918.88	45.79	0.3242
3 N/O	2.04(2)	5(1)	-9(3)	637.98	31.79	0.2251
4 N/O	2.04(2)	7(1)	-9(2)	515.13	25.67	0.1817
5 N/O	2.04(2)	9(1)	-10(2)	490.19	24.43	0.1729
6 N/O	2.04(2)	11(1)	-10(2)	524.62	26.14	0.1851
7 N/O	2.04(2)	13(2)	-11(2)	592.58	29.53	0.2091
2 S	2.13(3)	7(1)	-29(6)	915.98	45.65	0.3232
3 S	2.13(3)	10(1)	-28(5)	717.8	35.77	0.2533
4 S	2.14(2)	12(1)	-28(4)	624.88	31.14	0.2205
5 S	2.14(2)	14(1)	-28(4)	587.32	29.27	0.2072
6 S	2.15(2)	16(1)	-28(4)	580.67	28.94	0.2049
7 S	2.15(3)	18(1)	-28(4)	591.8	29.49	0.2088
2 N/O	2.02(2)	1(2)				
1 N/O	2.16(4)	0(4)	-5(3)	552.3	30.57	0.1949
2 N/O	1.99(2)	0(1)				
2 N/O	2.13(2)	1(2)	-7(2)	435.07	24.08	0.1535
3 N/O	2.02(2)	3(1)				
1 N/O	2.16(3)	0(3)	-8(2)	427.69	23.67	0.1509
4 N/O	2.03(2)	5(1)				
1 N/O	2.18(3)	3(3)	-8(2)	413.26	22.87	0.1458
3 N/O	2.01(2)	3(2)				
2 N/O	2.15(3)	3(3)	-8(2)	433.82	24.01	0.153
5 N/O	2.04(2)	9(2)				
1 N/O	2.3(2)	24(59)	-8(3)	494.91	27.39	0.1746

4 N/O	2.02(2)	6(2)				
2 N/O	2.18(6)	9(8)	-8(2)	489.13	27.07	0.1726
3 N/O	2.02(3)	5(2)				
3 N/O	2.15(6)	13(9)	-7(2)	492.78	27.28	0.1739
6 N/O	2.05(2)	11(2)				
1 N/O	2.4(2)	10(36)	-9(3)	518.8	28.72	0.183
5 N/O	2.05(2)	9(2)				
2 N/O	2.3(1)	33(48)	-7(3)	503.81	27.89	0.1777
4 N/O	2.05(2)	7(2)				
3 N/O	2.2(1)	34(33)	-7(3)	509.74	28.21	0.1798
2 S	2.11(2)	4(1)				
1 S	2.26(3)	2(2)	-25(4)	587.24	32.5	0.2072
2 S	2.10(2)	5(2)				
2 S	2.25(3)	6(2)	-24(4)	522.06	28.9	0.1842
3 S	2.13(2)	10(1)				
1 S	4.31(6)	2(5)	-30(5)	679.8	37.63	0.2398
4 S	2.13(2)	12(1)				
1 S	3.48(3)	3(3)	-30(4)	451.8	25.01	0.1594
3 S	2.12(2)	8(2)				
2 S	2.28(4)	8(3)	-24(4)	505.78	28	0.1784
5 S	2.15(3)	12(1)				
1 S	2.34(5)	6(4)	-24(4)	521.11	28.84	0.1839
4 S	2.17(2)	13(1)				
2 S	3.08(4)	10(4)	-22(3)	502.83	27.83	0.1774
3 S	2.12(3)	9(2)				
3 S	2.29(4)	13(4)	-23(4)	502.61	27.82	0.1773
6 S	No fit					
1 S						
5 S	2.14(3)	14(1)				
2 S	1.1(6)	60(110)	-28(5)	579.59	32.08	0.2045

4 S	2.14(3)	11(2)				
3 S	2.32(5)	15(6)	-22(4)	511.43	28.31	0.1804
2 N/O	1.99(2)	2(1)				
1 S	2.26(3)	6(3)	-13(3)	528.4	29.25	0.1864
1 N/O	1.96(2)	0(2)				
2 S	2.21(3)	9(2)	-18(4)	574.82	31.82	0.2028
2 N/O	1.98(2)	3(1)				
2 S	2.25(4)	12(3)	-15(3)	492.64	27.27	0.1738
3 N/O	2.00(2)	5(1)				
1 S	2.29(4)	8(4)	-12(3)	471.63	26.11	0.1664
1 N/O	3.88(8)	0(7)				
3 S	2.14(3)	10(1)	-28(5)	699.06	38.7	0.2466
1 N/O	No fit					
4 S						
4 N/O	2.02(2)	7(2)				
1 S	2.30(8)	15(9)	-11(3)	474.65	26.27	0.1675
2 N/O	0.86(5)	5(5)				
3 S	2.13(2)	10(1)	-29(4)	686.03	37.97	0.242
3 N/O	2.00(2)	6(2)				
2 S	2.28(6)	18(6)	-13(3)	475.4	26.31	0.1677
5 N/O	2.05(2)	12(4)				
1 S	1.83(3)	15(6)	-5(2)	429.36	23.76	0.1515
1 N/O	No fit					
5 S						
4 N/O	2.04(2)	7(1)				
2 S	2.5(2)	43(34)	-8(3)	475.45	26.32	0.1677
2 N/O	No fit					
4 S						
3 N/O	2.01(2)	6(2)				
3 S	2.27(7)	24(7)	-14(4)	479.08	26.52	0.169
6 N/O	2.04(2)	15(5)				

1 S	1.84(3)	12(5)	-6(2)	443.69	24.56	0.1565
1 N/O	1.67(6)	10(8)				
6 S	2.12(3)	15(1)	-32(5)	561.03	31.05	0.1979
5 N/O	2.04(2)	9(1)				
2 S	2.3(9)	85(292)	-10(5)	483.67	26.77	0.1706
2 N/O	No fit					
5 S						
4 N/O	2.04(2)	7(1)				
3 S	2.5(1)	47(28)	-8(3)	466.47	25.82	0.1646
3 N/O	2.53(9)	12(8)				
4 S	2.13(3)	12(1)	-29(5)	541.06	29.95	0.1909
3 N/O	1.98(3)	0(3)				
1 N/O	2.09(3)	6(3)	-7(4)	256.76	25.51	0.0906
(1 Im)						
2 N/O	1.97(1)	2(1)				
2 N/O	2.13(2)	1(1)	-9(2)	120.43	11.96	0.0424
(2 Im)						
1 N/O	2.02(1)	3(1)				
3 N/O	2.17(3)	0(2)	-7(2)	139.93	13.9	0.0493
(3 Im)						
4 N/O	1.96(3)	2(2)				
1 N/O	2.09(3)	11(4)	-9(3)	172.56	17.14	0.0608
(1 Im)						
4 N/O	1.95(3)	1(2)				
1 N/O	2.09(2)	9(3)	-9(2)	163.73	16.26	0.0577
(1 Im)						
3 N/O	**1.98(2)**	**2(2)**				
2 N/O	**2.13(3)**	**6(3)**	**-8(2)**	**114.28**	**11.35**	**0.0402**
(2 Im)						
2 N/O	2.00(1)	3(1)				
3 N/O	2.14(2)	3(2)	-9(2)	178.81	17.76	0.0631

(3 Im)						
4 N/O (1 Im)	2.03(1)	7(1)	-10(2)	228.98	18.98	0.0808
4 N/O (2 Im)	2.03(1)	7(1)	-10(2)	170.29	14.11	0.06
4 N/O (3 Im)	2.02(1)	7(1)	-12(2)	151.85	12.58	0.0535
5 N/O (1 Im)	2.03(2)	9(1)	-11(3)	254.22	21.07	0.0897
5 N/O (2 Im)	2.04(2)	9(1)	-10(2)	239.23	19.83	0.0844
5 N/O (3 Im)	2.04(1)	9(1)	-10(2)	213.44	17.69	0.0753
3 N/O **(2 Im)**	**2.00(1)**	**2(1)**	**1(2)**	**63.66**	**7.89**	**0.0224**
1 O	**1.96(5)**	**4(2)**				
1 O	**2.17(5)**					
1 C	**2.68(5)**					
1 C	**2.78(5)**					
2 N/O	2.04(1)	4(1)	2(2)	114.44	11.37	0.0403
1 N/O (2 Im)	2.16(2)	1(2)				
1 O	1.94(2)	4(2)				
1 O	2.15(2)					
1 C	2.66(2)					
1 C	2.76(2)					
2 N/O (2 Im)	2.04(1)	1(1)	2(2)	169.6	16.85	0.0598
1 O	1.88(2)	2(2)				
1 O	2.09(2)					
1 C	2.60(2)					
1 C	2.70(2)					

Table S4. EXAFS analysis of Ni(JMJD2A) (k = 2 – 12.5 Å^{-1} fit in r-space with values r = 1 – 4.5). Fits included in the text Table 1 are shown in **bold type**.

Shell	r(Å)	σ^2(Å^2)	ΔE_0(eV)	χ^2	Red χ^2	R
2 N/O	2.10(3)	0(2)	0(5)	1131.61	56.4	0.409
3 N/O	2.09(2)	0(1)	-2(3)	725.18	36.14	0.2621
4 N/O	2.09(1)	1(1)	-3(2)	542.76	27.05	0.1961
5 N/O	2.09(1)	2(1)	-3(2)	447.27	22.29	0.1616
6 N/O	2.09(1)	4(1)	-3(2)	415.89	20.72	0.1503
7 N/O	2.09(1)	5(1)	-4(2)	432.62	21.56	0.1563
2 S	2.17(2)	2(1)	-23(6)	881.67	43.94	0.3187
3 S	2.18(2)	4(1)	-23(4)	678.15	33.8	0.2451
4 S	2.18(2)	6(1)	-23(4)	582.6	29.03	0.2105
5 S	2.18(2)	8(1)	-23(3)	548.95	27.36	0.1984
6 S	2.19(2)	9(1)	-23(3)	552.14	27.52	0.1995
7 S	2.19(2)	10(1)	-23(3)	577.29	28.77	0.2086
2 N/O 1 N/O	2(1) 2(2)	0(26) 0(67)	-2(5)	715.08	39.58	0.2584
2 N/O 2 N/O	2.1(2) 2.1(2)	1(24) 0(8)	-2(3)	525.37	29.08	0.1899
3 N/O 1 N/O	2.07(7) 2.2(2)	0(7) 0(20)	-3(3)	525.5	29.09	0.1899
4 N/O 1 N/O	2.07(2) 2.17(9)	1(3) 0(11)	-3(2)	427.71	23.67	0.1546
3 N/O 2 N/O	2.13(6) 2.05(9)	2(10) 0(5)	-3(2)	427.57	23.67	0.1545
5 N/O 1 N/O	2.08(2) 2.20(6)	2(2) 0(7)	-3(2)	398.18	22.04	0.1439
4 N/O	2.06(2)	2(2)				

2 N/O	2.18(3)	4(4)	-3(2)	387.17	21.43	0.1399
3 N/O	2.05(3)	3(3)				
3 N/O	2.15(3)	4(4)	-3(2)	386.97	21.42	0.1398
6 N/O	2.10(1)	4(1)				
1 N/O	1.53(8)	19(17)	-2(2)	375.64	20.79	0.1357
4 N/O	2.06(3)	3(3)				
3 N/O	2.17(4)	7(7)	-3(2)	422.2	23.37	0.1526
5 N/O	2.09(1)	3(1)				
2 N/O	2.2(1)	14(23)	-2(2)	421.66	23.34	0.1524
2 S	2.15(3)	1(3)				
1 S	2.27(5)	0(4)	-21(6)	626.73	34.69	0.2265
2 S	2.14(2)	0(2)				
2 S	2.27(3)	1(2)	-20(4)	531.57	29.42	0.1921
3 S	2.18(2)	4(1)				
1 S	1.58(8)	16(10)	-23(5)	630.24	34.89	0.2278
4 S	2.18(2)	6(1)				
1 S	3.88(7)	2(6)	-23(4)	557.6	30.86	0.2015
3 S	2.16(2)	3(2)				
2 S	2.29(4)	4(4)	-19(4)	514.58	28.48	0.186
5 S	No fit					
1 S						
4 S	2.18(2)	5(2)				
2 S	2.33(6)	8(8)	-19(4)	504.92	27.95	0.1825
3 S	2.17(2)	4(2)				
3 S	2.30(6)	11(8)	-18(4)	500.79	27.72	0.181
6 S	2.19(2)	9(1)				
1 S	1.1(3)	14(27)	-22(3)	542.32	30.02	0.196
4 S	2.19(2)	6(2)				
3 S	2.34(6)	13(9)	-17(4)	485.69	26.88	0.1755
5 S	2.19(1)	8(1)				
2 S	2.93(3)	6(3)	-21(2)	328.19	18.16	0.1186

2 N/O 1 S	2.05(4) 2.26(5)	0(2) 2(4)	-8(6)	688.09	38.09	0.2487
1 N/O 2 S	2.76(7) 2.18(2)	0(7) 2(1)	-21(6)	822.71	45.54	0.2974
2 N/O 2 S	2.03(3) 2.25(3)	0(2) 4(2)	-11(4)	543.07	30.06	0.1963
3 N/O 1 S	2.05(2) 2.28(3)	0(1) 1(2)	-8(3)	491.52	27.21	0.1776
1 N/O 3 S	0.8(5) 2.18(2)	11(126) 4(1)	-23(5)	674.2	37.32	0.2437
4 N/O 1 S	2.06(2) 2.29(3)	1(1) 3(3)	-7(3)	451.44	24.99	0.1631
1 N/O 4 S	No fit					
2 N/O 3 S	2.03(2) 2.24(3)	0(2) 8(2)	-13(4)	511.66	28.32	0.1849
3 N/O 2 S	2.05(2) 2.27(3)	1(1) 7(3)	-10(4)	490.55	27.15	0.1773
5 N/O 1 S	2.10(1) 2.63(3)	2(1) 4(3)	-2(2)	335.85	18.59	0.1214
1 N/O 5 S	No fit					
4 N/O 2 S	2.07(2) 2.28(5)	2(1) 11(5)	-8(3)	467.61	25.88	0.169
2 N/O 4 S	1.8(1) 2.18(2)	15(19) 6(1)	-25(5)	549.49	30.41	0.1986
3 N/O 3 S	3.18(4) 2.17(2)	1(3) 4(1)	-25(4)	540.09	29.89	0.1952
6 N/O 1 S	2.10(1) 1.88(8)	4(1) 23(19)	-2(2)	396.38	21.94	0.1432

1 N/O 6 S	No fit					
5 N/O 2 S	2.10(1) 2.63(3)	3(1) 10(4)	-1(1)	339.62	18.8	0.1227
2 N/O 5 S	2.75(4) 2.20(2)	2(4) 8(1)	-20(3)	453.74	25.11	0.164
4 N/O 3 S	2.09(1) 2.54(8)	1(1) 27(14)	-2(2)	427.28	23.65	0.1544
3 N/O 4 S	3.18(4) 2.17(2)	2(3) 6(1)	-24(3)	451.23	24.98	0.1631
5 N/O 1 N/O (1 Im)	2.11(3) 2.02(6)	4(3) 0(4)	-1(2)	233.56	23.2	0.0844
6 N/O (1 Im)	2.08(1)	3(1)	6(2)	207.61	17.21	0.075
4 N/O 1 N/O (1 Im)	2.11(2) 2.01(6)	2(2) 0(5)	-1(2)	238.72	23.72	0.0862
5 N/O (1 Im)	2.08(1)	2(1)	6(2)	269.19	22.31	0.0973
6 N/O 1 N/O (1 Im)	2.09(2) 2.1(2)	4(1) 14(81)	-3(2)	254.01	25.24	0.0918
7 N/O (1 Im)	2.08(1)	4(1)	6(2)	183.02	15.17	0.0661
3 N/O 3 N/O (3 Im)	2.15(3) 2.03(3)	1(3) 1(2)	0(3)	253.9	25.23	0.0917
6 N/O (3 Im)	2.08(1)	3(1)	5(1)	143.64	11.9	0.0519
2 N/O 3 N/O (3 Im)	2.16(3) 2.04(2)	0(3) 0(2)	2(3)	166.79	16.57	0.0602

5 N/O (3 Im)	2.08(1)	2(1)	5(2)	194.27	16.1	0.0702
4 N/O 3 N/O (3 Im)	2.11(3) 2.05(2)	5(3) 3(3)	-1(2)	146.71	14.57	0.053
7 N/O (3 Im)	2.08(1)	4(1)	5(1)	155.78	12.91	0.0563
4 N/O 2 N/O (2 Im)	2.13(2) 2.02(2)	2(2) 0(2)	-1(2)	90.89	9.03	0.0328
6 N/O (2 Im)	**2.08(1)**	**4(1)**	**5(1)**	**75.6**	**6.26**	**0.0273**
3 N/O 2 N/O (2 Im)	2.14(2) 2.02(3)	1(2) 0(2)	1(2)	183.8	18.26	0.0664
5 N/O (2 Im)	2.08(1)	2(1)	5(2)	208.63	17.29	0.0754
5 N/O 2 N/O (2 Im)	2.11(4) 2.05(3)	6(3) 2(3)	-1(2)	158.3	15.73	0.0572
7 N/O (2 Im)	2.08(1)	4(1)	5(1)	138.05	11.44	0.0499
4 N/O (2 Im) 1 O 1 O 1 C 1 C	2.13(3) 1.99(3) 2.10(3) 2.77(3) 2.86(3)	4(2) 3(3)	-1(2)	162.52	16.15	0.0587
3 N/O 1 N/O (2 Im) 1 O 1 O 1 C 1 C	2.1(9) 2.1(2) 1.98(5) 2.09(5) 2.76(5) 2.85(5)	1(16) 4(46) 0(16)	-1(6)	135.01	16.74	0.0488

2 N/O	2.2(2)	13(46)	-1(6)	166.29	20.62	0.0601
2 N/O (2 Im)	2.13(9)	4(4)				
1 O	1.98(5)	0(10)				
1 O	2.09(5)					
1 C	2.76(5)					
1 C	2.85(5)					

Table S5. EXAFS analysis of Ni(JMJD2A)-αKG (k = 2 – 12.5 Å^{-1} fit in r-space with values r = 1 – 4.5). Fits included in the text Table 1 are shown in **bold type**.

Shell	r(Å)	σ^2(Å^2)	ΔE_0(eV)	χ^2	Red χ^2	R
2 N/O	2.09(3)	0(2)	-1(7)	1811.79	77.51	0.4251
3 N/O	2.08(2)	0(1)	-3(4)	676.96	28.96	0.29
4 N/O	2.08(1)	2(1)	-3(3)	497.34	21.27	0.213
5 N/O	2.08(1)	3(1)	-4(2)	388.48	16.62	0.1664
6 N/O	2.08(1)	4(1)	-5(2)	310.43	13.28	0.1329
7 N/O	2.08(1)	4(1)	-5(2)	330.62	14.14	0.1416
2 S	2.17(2)	2(1)	-23(6)	630.04	26.95	0.2699
3 S	2.17(2)	4(1)	-23(4)	429.06	18.35	0.1838
4 S	2.17(1)	6(1)	-24(3)	334.04	14.28	0.1431
5 S	2.17(1)	7(1)	-24(3)	298.01	12.74	0.1276
6 S	2.17(1)	8(1)	-25(3)	296.12	12.67	0.1269
7 S	2.17(1)	10(1)	-25(3)	315.6	13.5	0.1352
2 N/O 1 N/O	2.1(6) 2(1)	0(27) 0(43)	-3(6)	668.49	31.27	0.2863
2 N/O 2 N/O	2.16(7) 2.00(7)	0(7) 0(6)	-4(4)	471.44	22.05	0.2019
3 N/O 1 N/O	2.07(7) 2.1(2)	1(7) 0(13)	-3(4)	484.08	22.64	0.2073
4 N/O 1 N/O	2.07(3) 2.1(1)	2(4) 0(8)	-4(3)	371.48	17.38	0.1591
3 N/O 2 N/O	2.01(3) 2.17(4)	1(3) 0(4)	-4(3)	353.28	16.52	0.1513
5 N/O 1 N/O	2.03(2) 2.19(7)	3(3) 0(6)	-5(2)	311.35	14.56	0.1333
4 N/O	2.02(2)	2(2)				

2 N/O	2.17(3)	0(3)	-5(2)	294.27	13.76	0.126
3 N/O	2.00(2)	2(2)				
3 N/O	2.16(2)	3(2)	-5(2)	272.81	12.76	0.1168
6 N/O	2.04(2)	4(2)				
1 N/O	2.18(6)	0(5)	-5(2)	292.47	13.68	0.1252
4 N/O	2.01(1)	1(1)				
3 N/O	2.16(2)	2(2)	-5(2)	264.99	12.39	0.1135
5 N/O	2.02(2)	2(2)				
2 N/O	2.18(3)	0(2)	-6(2)	277.72	12.99	0.1189
2 S	2.21(2)	2(2)				
1 S	2.11(3)	0(2)	-23(5)	353.46	16.53	0.1514
2 S	2.23(2)	1(1)				
2 S	2.11(1)	1(1)	-24(3)	266.15	12.45	0.114
3 S	2.21(2)	3(1)				
1 S	2.09(2)	0(1)	-23(3)	272.68	12.74	0.1168
4 S	2.20(2)	5(1)				
1 S	2.09(2)	7(1)	-24(3)	271.05	12.68	0.1161
3 S	2.22(2)	3(1)				
2 S	2.11(2)	2(1)	-24(3)	272.22	12.73	0.1166
5 S	No fit					
1 S						
4 S	2.17(6)	7(3)				
2 S	2.2(2)	11(21)	-23(5)	294.16	13.75	0.126
3 S	2.2(1)	7(5)				
3 S	2.2(1)	9(16)	-23(5)	293.93	13.75	0.1259
6 S	No fit					
1 S						
4 S	2.18(1)	6(1)				
3 S	2.3(2)	20(20)	-22(8)	295.09	13.8	0.1264

5 S	2.18(1)	7(1)				
2 S	2.94(3)	7(3)	-23(2)	202.88	9.49	0.0869
2 N/O	2.02(2)	0(1)				
1 S	2.25(2)	2(1)	-11(5)	411.76	19.26	0.1763
1 N/O	2.42(6)	0(4)				
2 S	2.16(2)	2(1)	-27(6)	506.82	23.71	0.217
2 N/O	1.99(2)	0(1)				
2 S	2.22(2)	2(1)	-16(3)	271.16	12.68	0.1161
3 N/O	2.02(1)	0(1)				
1 S	2.25(2)	0(1)	-11(3)	272.09	12.73	0.1165
1 N/O	1.14(6)	3(5)				
3 S	2.17(2)	4(1)	-23(4)	422.97	19.78	0.1811
1 N/O	1.14(6)	3(5)				
4 S	2.17(1)	6(1)	-24(3)	329.08	15.39	0.1409
4 N/O	2.03(1)	1(1)				
1 S	2.25(1)	0(1)	-11(3)	245.93	11.5	0.1053
2 N/O	1.99(2)	1(1)				
3 S	2.22(2)	5(1)	-17(3)	266.72	12.52	0.1142
3 N/O	2.01(2)	1(1)				
2 S	2.23(2)	3(1)	-15(3)	259.71	12.13	0.1112
5 N/O	2.04(2)	3(1)				
1 S	2.26(2)	1(1)	-11(3)	250.37	11.75	0.1072
1 N/O	0.07(7)	228(97)				
5 S	2.17(1)	7(1)	-25(3)	294.28	13.77	0.126
4 N/O	2.02(2)	3(1)				
2 S	2.24(2)	5(2)	-13(3)	267.42	12.52	0.1145
2 N/O	2.77(5)	5(6)				
4 S	2.18(1)	6(1)	-22(3)	308.29	14.45	0.132
3 N/O	2.02(3)	3(2)				
3 S	2.22(2)	6(2)	-16(4)	276.06	12.9	0.1182

6 N/O 1 S	2.05(2) 2.25(2)	5(1) 3(2)	-10(2)	265.09	12.4	0.1135
1 N/O 6 S	No fit					
5 N/O 2 S	2.05(3) 2.23(2)	5(2) 6(3)	-12(3)	274.2	12.83	0.1174
2 N/O 5 S	1.3(2) 2.17(1)	25(34) 7(1)	-24(3)	298.25	13.94	0.1277
4 N/O 3 S	2.04(3) 2.22(3)	5(3) 8(3)	-15(4)	280.73	13.14	0.1202
3 N/O 4 S	2.76(5) 2.18(1)	8(7) 6(1)	-21(3)	304.56	14.25	0.1304
4 N/O 2 N/O (2 Im)	**2.14(1) 1.98(1)**	**1(1) 1(1)**	**-2(2)**	**77.28**	**5.77**	**0.0331**
6 N/O (2 Im)	2.08(1)	3(1)	5(2)	181.74	11.81	0.0778
3 N/O 2 N/O (2 Im)	2.13(1) 2.00(2)	0(1) 0(1)	-1(2)	135.05	10.09	0.0578
5 N/O (2 Im)	2.08(1)	3(1)	6(2)	252.53	16.42	0.1081
5 N/O 2 N/O (2 Im)	2.13(1) 1.98(1)	2(1) 1(1)	-2(1)	116.13	8.67	0.0497
7 N/O (2 Im)	2.07(1)	4(1)	5(2)	144.2	9.37	0.0617
5 N/O 1 N/O (1 Im)	2.11(1) 2.00(4)	3(1) 0(3)	-2(2)	147.57	11.02	0.0632
6 N/O (1 Im)	2.08(1)	3(1)	6(2)	183.5	11.93	0.0786

4 N/O	2.12(2)	2(2)				
1 N/O	2.00(5)	0(3)	-1(2)	194.7	14.55	0.0834
(1 Im)						
5 N/O	2.08(1)	3(1)	6(2)	253.1	16.45	0.1084
(1 Im)						
6 N/O	2.13(1)	4(1)				
1 N/O	1.97(3)	0(2)	-2(2)	145.92	10.9	0.0625
(1 Im)						
7 N/O	2.08(1)	4(1)	5(2)	147.33	9.57	0.0631
(1 Im)						
3 N/O	2.15(1)	2(1)				
3 N/O	2.00(1)	2(1)	0(1)	103.45	7.73	0.0443
(3 Im)						
6 N/O	2.08(1)	3(1)	5(2)	181.95	11.83	0.0779
(3 Im)						
2 N/O	2.16(2)	0(2)				
3 N/O	2.01(1)	1(1)	0(2)	154.89	11.57	0.0663
(3 Im)						
5 N/O	2.07(1)	3(1)	5(3)	253.34	16.47	0.1085
(3 Im)						
4 N/O	2.14(1)	1(1)				
3 N/O	2.00(1)	1(1)	-1(1)	108.38	8.09	0.0464
(3 Im)						
7 N/O	2.08(1)	4(1)	5(2)	144.36	9.38	0.0618
(3 Im)						
4 N/O	**2.08(2)**	**3(2)**	**5(3)**	**47.57**	**3.55**	**0.0305**
(2 Im)						
1 O	**2.00(6)**	**5(5)**				
1 O	**2.05(6)**					
1 C	**2.67(6)**					
1 C	**2.69(6)**					
3 N/O	2.08(5)	5(4)	3(1)	166.48	14.63	0.0713
1 N/O	2.15(7)	0(4)				
(2 Im)						
1 O	1.97(4)	3(3)				

1 O	2.02(4)					
1 C	2.64(4)					
1 C	2.66(4)					
2 N/O	2.02(4)	2(5)	1(2)	141.22	12.41	0.0605
2 N/O	2.15(2)	0(2)				
(2 Im)						
1 O	1.99(4)	4(4)				
1 O	2.04(4)					
1 C	2.66(4)					
1 C	2.68(4)					
5 N/O	2.06(1)	3(1)	2(3)	213.19	15.93	0.0912
(2 Im)						
1 O	1.89(3)	2(2)				
1 O	1.94(3)					
1 C	2.56(3)					
1 C	2.58(3)					
4 N/O	2.10(2)	2(2)	5(2)	116.6	10.24	0.0499
1 N/O	2.50(3)	0(3)				
(2 Im)						
1 O	1.97(3)	2(2)				
1 O	2.02(3)					
1 C	2.64(3)					
1 C	2.66(3)					
3 N/O	2.02(4)	1(2)	3(2)	110.42	9.7	0.0473
2 N/O	2.15(2)	4(4)				
(2 Im)						
1 O	2.06(5)	4(1)				
1 O	2.11(5)					
1 C	2.73(5)					
1 C	2.75(5)					
4 N/O	2.05(1)	2(1)	1(4)	277.24	20.72	0.1187
(3 Im)						
1 O	1.89(3)	2(2)				
1 O	1.94(3)					
1 C	2.56(3)					
1 C	2.58(3)					
3 N/O	2.11(2)	2(2)	6(3)		14.09	0.0687
1 N/O	2.50(4)	0(4)				
(3 Im)						
1 O	1.97(2)	2(2)				

1 O	2.02(2)					
1 C	2.64(2)					
1 C	2.66(2)					
2 N/O	2.03(5)	6(6)	3(2)	148.96	13.09	0.0638
2 N/O	2.16(2)	0(2)				
(3 Im)						
1 O	2.00(5)	7(7)				
1 O	2.05(5)					
1 C	2.67(5)					
1 C	2.69(5)					
5 N/O	2.06(1)	3(1)	2(3)	194.08	14.51	0.0831
(3 Im)						
1 O	1.89(3)	2(2)				
1 O	1.94(3)					
1 C	2.56(3)					
1 C	2.58(3)					
4 N/O	2.11(2)	2(1)	6(3)	133.52	11.73	0.0572
1 N/O	2.50(3)	0(3)				
(3 Im)						
1 O	1.96(2)	3(2)				
1 O	2.01(2)					
1 C	2.73(2)					
1 C	2.75(2)					
3 N/O	2.01(2)	2(2)	3(2)	94.83	8.34	0.0406
2 N/O	2.15(2)	0(2)				
(3 Im)						
1 O	2.07(4)	5(5)				
1 O	2.12(4)					
1 C	2.74(4)					
1 C	2.76(4)					

Table S6. EXAFS analysis of Ni(JMJD2A)-αKG + substrate (k = 2 – 12.5 Å^{-1} fit in r-space with values r = 1 – 4.5). Fits included in the text Table 1 are shown in **bold type**.

Shell	r(Å)	σ^2(Å^2)	ΔE_0(eV)	χ^2	Red χ^2	R
2 N/O	2.09(2)	0(1)	-1(5)	436.96	18.69	0.4014
3 N/O	2.09(1)	1(1)	-2(3)	294.55	12.6	0.2706
4 N/O	2.09(1)	2(1)	-3(2)	208.52	8.92	0.1915
5 N/O	2.09(1)	3(1)	-3(2)	160.06	6.84	0.147
6 N/O	2.09(1)	4(1)	-4(1)	140.02	5.99	0.1286
7 N/O	2.09(1)	5(1)	-4(1)	141.65	6.06	0.1301
2 S	2.18(2)	3(1)	-22(5)	311.01	13.3	0.2857
3 S	2.18(1)	4(1)	-23(4)	212.93	9.11	0.1956
4 S	2.18(1)	6(1)	-23(3)	166.77	7.13	0.1532
5 S	2.18(1)	7(1)	-23(2)	150.53	6.44	0.1384
6 S	2.18(1)	9(1)	-23(2)	152.62	6.53	0.1402
7 S	2.18(1)	10(1)	-24(2)	165.46	7.07	0.1519
2 N/O 1 N/O	2.1(3) 2.1(6)	0(18) 0(24)	-2(4)	288.91	13.51	0.2654
2 N/O 2 N/O	2.17(5) 2.04(5)	0(5) 0(5)	-3(3)	193.77	9.06	0.178
3 N/O 1 N/O	2.07(4) 2.1(1)	1(4) 0(9)	-3(3)	200.67	9.38	0.1843
4 N/O 1 N/O	2.04(3) 2.18(8)	2(3) 0(6)	-3(2)	151.68	7.09	0.1393
3 N/O 2 N/O	2.16(2) 2.00(3)	3(3) 0(3)	-3(2)	142.08	6.64	0.1305
5 N/O 1 N/O	2.04(2) 2.19(5)	3(2) 0(4)	-4(2)	131.5	6.15	0.1208

4 N/O	2.02(2)	2(2)				
2 N/O	2.18(2)	2(2)	-4(2)	125.51	5.87	0.1153
3 N/O	2.01(1)	2(2)				
3 N/O	2.16(1)	3(2)	-4(1)	103.51	4.84	0.0951
6 N/O	2.09(1)	4(1)				
1 N/O	2.87(3)	0(3)	-4(1)	119.02	5.56	0.1093
4 N/O	2.02(1)	1(1)				
3 N/O	2.16(1)	2(1)	-5(1)	131.88	6.17	0.1211
5 N/O	2.03(1)	2(2)				
2 N/O	2.18(2)	2(2)	-5(2)	133.17	6.23	0.1233
2 S	2.22(2)	2(2)				
1 S	2.11(2)	0(2)	-22(4)	180.88	8.46	0.1661
2 S	2.12(2)	1(1)				
2 S	2.24(2)	1(1)	-23(3)	150.72	7.05	0.1384
3 S	2.21(2)	3(1)				
1 S	2.10(2)	0(1)	-22(3)	149.08	6.97	0.1369
4 S	No fit					
1 S						
3 S	2.14(2)	4(2)				
2 S	2.25(30	4(3)	-22(3)	147.01	6.88	0.135
5 S	No fit					
1 S						
4 S	2.18(2)	6(2)				
2 S	2.30(8)	13(13)	-20(4)	142.44	6.66	0.1308
3 S	2.17(2)	5(1)				
3 S	2.26(7)	12(8)	-20(4)	143.31	6.7	0.1316
6 S	No fit					
1 S						
4 S	2.18(1)	6(1)				
3 S	2.32(6)	16(10)	-19(3)	137.43	6.43	0.1262

5 S 2 S	No fit					
2 N/O 1 S	2.04(2) 2.25(2)	0(1) 1(2)	-10(4)	206.25	9.64	0.1895
1 N/O 2 S	2.43(6) 2.16(2)	0(4) 2(1)	-25(6)	266.68	12.46	0.245
2 N/O 2 S	2.01(2) 2.23(2)	0(1) 3(1)	-15(3)	150.52	7.04	0.1383
3 N/O 1 S	2.03(1) 2.25(1)	0(1) 0(1)	-11(3)	146.44	6.83	0.1343
1 N/O 3 S	0.78(4) 2.18(1)	2(5) 4(1)	-23(3)	207.49	9.7	0.1907
1 N/O 4 S	2.6(2) 2.18(1)	10(26) 6(1)	-22(3)	157.05	7.34	0.1443
4 N/O 1 S	2.04(1) 2.26(2)	2(1) 1(1)	-10(2)	132.02	6.17	0.1213
2 N/O 3 S	2.01(2) 2.22(2)	2(2) 6(1)	-16(3)	145.08	6.78	0.1333
3 N/O 2 S	2.03(2) 2.24(2)	2(1) 4(1)	-13(3)	141.71	6.62	0.1302
5 N/O 1 S	2.06(2) 2.26(2)	4(1) 3(2)	-9(2)	129.3	6.04	0.1188
1 N/O 5 S	0.78(4) 2.18(1)	3(5) 7(1)	-23(2)	147.26	6.88	0.1353
4 N/O 2 S	2.05(2) 2.24(2)	4(1) 6(2)	-11(3)	138.23	6.46	0.127
2 N/O 4 S	0.8(1) 2.18(1)	6(7) 6(1)	-24(3)	163.91	7.66	0.1506
3 N/O 3 S	2.04(2) 2.22(2)	3(2) 7(2)	-14(3)	143.45	6.7	0.1318

6 N/O 1 S	2.08(2) 2.23(3)	5(1) 6(4)	-7(2)	130.97	6.12	0.1203
1 N/O 6 S	No fit					
2 N/O 5 S	1(1) 2.18(1)	95(200) 7(1)	-23(3)	149.22	6.97	0.1371
5 N/O 2 S	2.07(2) 2.24(3)	5(2) 8(4)	-10(3)	136.33	6.37	0.1253
4 N/O 3 S	2.06(2) 2.23(3)	4(2) 9(3)	-12(3)	141.82	6.63	0.1303
3 N/O 4 S	2.68(8) 2.19(1)	12(12) 6(1)	-21(3)	131.26	6.13	0.1206
4 N/O 2 N/O (2 Im)	**2.14(1) 1.99(1)**	**1(1) 1(1)**	**-1(1)**	**36.82**	**2.74**	**0.0338**
6 N/O (2 Im)	2.08(1)	4(1)	5(1)	70.18	4.55	0.0644
3 N/O 2 N/O (2 Im)	2.15(2) 2.00(2)	3(2) 2(2)	0(1)	37.45	2.79	0.036
5 N/O (2 Im)	2.08(1)	3(1)	5(2)	103.28	6.71	0.0948
5 N/O 2 N/O (2 Im)	2.14(2) 2.00(4)	5(2) 3(3)	-2(1)	60.19	4.49	0.0553
7 N/O (2 Im)	2.08(1)	5(1)	4(1)	51.16	3.32	0.047
5 N/O 1 N/O (1 Im)	2.11(1) 2.00(3)	3(1) 0(2)	-2(1)	53.6	4	0.0492

6 N/O (1 Im)	2.08(1)	4(1)	6(1)	65.31	4.24	0.06
4 N/O 1 N/O (1 Im)	2.11(1) 2.00(3)	2(1) 0(3)	-2(2)	63.77	4.76	0.0586
5 N/O (1 Im)	2.08(1)	3(1)	6(2)	96.58	6.28	0.0887
6 N/O 1 N/O (1 Im)	2.13(1) 1.97(3)	4(1) 0(2)	-3(1)	68.62	5.12	0.063
7 N/O (1 Im)	2.08(1)	5(1)	5(1)	47.67	3.09	0.0438
3 N/O 3 N/O (3 Im)	2.15(1) 2.01(1)	2(1) 1(1)	0(1)	38.99	2.91	0.0358
6 N/O (3 Im)	2.08(1)	4(1)	4(1)	69.98	4.55	0.0643
2 N/O 3 N/O (3 Im)	2.16(1) 2.02(1)	1(1) 1(1)	1(1)	52.82	3.94	0.0485
5 N/O (3 Im)	2.08(1)	3(1)	6(2)	104.05	6.761	0.0956
4 N/O 3 N/O (3 Im)	2.15(2) 2.00(3)	4(2) 4(2)	-1(1)	54.2	4.05	0.0498
7 N/O (3 Im)	2.08(1)	4(1)	4(1)	54.59	3.54	0.0501
4 N/O **(2 Im)** **1 O** **1 O** **1 C**	**2.09(2)** **1.98(4)** **2.03(4)** **2.65(4)**	**3(1)** **4(3)**	**4(2)**	**18.18**	**1.59**	**0.0303**

1 C	**2.67(4)**					
2 N/O	2.02(2)	0(3)	2(1)	71.75	5.36	0.0659
2 N/O	2.14(2)	3(3)				
(2 Im)						
1 O	2.01(5)	7(7)				
1 O	2.06(5)					
1 C	2.68(5)					
1 C	2.70(5)					
3 N/O	2.05(3)	5(4)	3(1)	53.55	4.7	0.0492
1 N/O	2.16(4)	0(4)				
(2 Im)						
1 O	2.01(5)	6(5)				
1 O	2.06(5)					
1 C	2.68(5)					
1 C	2.70(5)					
3 N/O	2.10(1)	1(1)	5(2)	88.79	6.63	0.0815
(2 Im)						
1 O	1.97(2)	2(2)				
1 O	2.02(2)					
1 C	2.64(2)					
1 C	2.66(2)					
2 N/O	2.07(6)	6(6)	4(2)	74.69	6.56	0.0686
1 N/O	2.16(5)	0(4)				
(2 Im)						
1 O	1.99(4)	3(3)				
1 O	2.04(4)					
1 C	2.66(4)					
1 C	2.68(4)					
5 N/O	2.08(1)	3(1)	4(2)	65.42	4.89	0.0601
(2 Im)						
1 O	1.97(7)	9(6)				
1 O	2.02(7)					
1 C	2.64(7)					
1 C	2.66(7)					
5 N/O	2.08(1)	4(1)	6(2)	62.88	4.7	0.0577
(1 Im)						
1 O	2.03(7)	8(6)				
1 O	2.08(7)					
1 C	2.70(7)					
1 C	2.72(7)					

3 N/O	2.10(1)	1(1)	4(2)	96.54	7.21	0.0887
(3 Im)						
1 O	1.96(2)	2(2)				
1 O	2.01(2)					
1 C	2.63(2)					
1 C	2.65(2)					
2 N/O	2.08(6)	4(4)	3(2)	75.9	6.67	0.0697
1 N/O	2.15(7)	0(4)				
(3 Im)						
1 O	1.97(7)	2(2)				
1 O	2.02(7)					
1 C	2.64(7)					
1 C	2.66(7)					

Table S7. EXAFS analysis of Fe(JMJD2C) (k = 2 – 12.5 Å^{-1} fit in r-space with values r = 1 – 4.5). Fits included in the text Table 1 are shown in **bold type**.

Shell	r(Å)	σ^2(Å^2)	ΔE_0(eV)	χ^2	Red χ^2	R
2 N/O	2.05(2)	1(1)	-9(5)	168.55	8.4	0.3389
3 N/O	2.05(2)	3(1)	-10(3)	113.36	5.65	0.2279
4 N/O	2.05(1)	5(1)	-10(2)	84.78	4.22	0.1705
5 N/O	2.05(1)	7(1)	-11(2)	73.56	3.66	0.1479
6 N/O	2.05(1)	8(1)	-12(2)	73.73	3.67	0.1482
7 N/O	2.04(1)	10(1)	-13(2)	81.2	4.04	0.1632
2 S	2.14(2)	5(1)	-30(6)	145.72	7.26	0.293
3 S	2.14(2)	8(1)	-30(4)	106.61	5.31	0.2144
4 S	2.15(2)	10(1)	-30(4)	88.14	4.39	0.1772
5 S	2.15(2)	12(1)	-30(3)	80.82	4.02	0.1625
6 S	2.15(2)	13(1)	-30(3)	79.84	3.97	0.1605
7 S	2.15(2)	15(1)	-30(3)	82.56	4.11	0.166
2 N/O	2.00(3)	1(4)				
1 N/O	2.15(6)	0(7)	-9(4)	102.62	5.68	0.2063
2 N/O	2.00(2)	0(2)				
2 N/O	2.13(2)	1(3)	-9(2)	68.17	3.77	0.137
3 N/O	2.01(2)	2(2)				
1 N/O	2.15(4)	0(4)	-10(3)	74.4	4.11	0.1496
4 N/O	2.01(2)	4(2)				
1 N/O	2.16(3)	0(3)	-10(2)	64.88	3.59	0.1304
3 N/O	1.99(1)	1(1)				
2 N/O	2.14(2)	2(2)	-10(2)	61.87	3.42	0.1244
5 N/O	2.03(2)	5(1)				
1 N/O	2.17(3)	0(3)	-11(2)	69.93	3.87	0.1406

4 N/O	2.00(2)	4(2)				
2 N/O	2.15(3)	3(3)	-11(2)	70.09	3.88	0.1409
3 N/O	1.98(2)	3(2)				
3 N/O	2.13(3)	4(3)	-11(2)	70.78	3.91	0.1423
6 N/O	2.05(1)	8(1)				
1 N/O	2.89(3)	0(3)	-12(2)	51.24	2.83	0.103
4 N/O	2.04(2)	6(2)				
3 N/O	2.1(2)	24(15)	-11(5)	80.28	4.44	0.1614
5 N/O	2.06(2)	7(1)				
2 N/O	1.56(7)	36(20)	-8(3)	67.4	3.73	0.1355
2 S	2.11(2)	3(1)				
1 S	2.25(3)	0(2)	-28(4)	86.11	4.76	0.1731
2 S	2.10(2)	4(2)				
2 S	2.24(3)	5(2)	-27(4)	74.49	4.12	0.1498
3 S	No fit					
1 S						
4 S	2.15(2)	10(1)				
1 S	1.80(9)	34(10)	-28(3)	63.76	3.52	0.1282
3 S	2.10(2)	8(1)				
2 S	2.60(6)	11(5)	-38(5)	99.18	5.49	0.1994
5 S	No fit					
1 S						
4 S	No fit					
2 S						
3 S	2.12(2)	8(2)				
3 S	2.26(5)	11(5)	-26(4)	72.02	3.98	0.1448
6 S	No fit					
1 S						
4 S	2.14(2)	10(1)				
3 S	1.4(3)	64(97)	-30(5)	87.24	4.82	0.1754

5 S	2.16(1)	12(1)				
2 S	2.96(3)	8(3)	-27(3)	58.33	3.22	0.1173
2 N/O	1.99(2)	0(1)				
1 S	2.24(2)	3(2)	-17(3)	79.25	4.38	0.1593
1 N/O	1.94(3)	0(2)				
2 S	2.19(3)	6(2)	-24(5)	86.48	4.78	0.1739
2 N/O	1.98(2)	2(1)				
2 S	2.23(3)	8(2)	-19(3)	70.81	3.92	0.1424
3 N/O	2.00(2)	3(1)				
1 S	2.26(3)	5(2)	-15(3)	68.3	3.78	0.1373
1 N/O	No fit					
3 S						
1 N/O	No fit					
4 S						
4 N/O	2.01(2)	5(1)				
1 S	2.27(4)	8(4)	-15(3)	66.88	3.7	0.1345
2 N/O	No fit					
3 S						
3 N/O	2.00(2)	4(1)				
2 S	2.25(4)	11(3)	-17(3)	68.02	3.76	0.1367
5 N/O	2.06(2)	9(2)				
1 S	1.84(2)	12(5)	-6(2)	61.71	3.41	0.1241
1 N/O	No fit					
5 S						
4 N/O	2.02(2)	6(2)				
2 S	2.25(5)	16(6)	-16(3)	68.83	3.81	0.1384
2 N/O	No fit					
4 S						
3 N/O	2.01(2)	5(2)				
3 S	2.23(4)	16(4)	-18(4)	68.99	3.81	0.1387
6 N/O	2.05(2)	11(3)				
1 S	1.85(3)	11(5)	-7(2)	63.72	3.52	0.1281

1 N/O	18(1)	0(124)				
6 S	2.15(2)	13(1)	-30(3)	77.19	4.27	0.1552
5 N/O	2.03(2)	7(2)				
2 S	2.22(7)	22(13)	-15(3)	70.66	3.91	0.1421
2 N/O	0.86(4)	5(4)				
5 S	2.15(2)	12(1)	-30(3)	76.53	4.23	0.1539
4 N/O	2.02(2)	6(2)				
3 S	2.23(5)	21(7)	-17(4)	69.9	3.86	0.1405
3 N/O	5.4(2)	0(29)				
4 S	2.15(2)	10(1)	-30(4)	87.27	4.83	0.1755
4 N/O	2.01(1)	3(1)				
2 N/O (2 Im)	2.15(2)	2(2)	-12(2)	18.61	1.85	0.0374
6 N/O (2 Im)	2.04(1)	8(1)	-13(2)	24.85	2.06	0.0499
3 N/O	**1.99(1)**	**1(1)**				
2 N/O (2 Im)	**2.15(1)**	**2(1)**	**-11(1)**	**13.84**	**1.37**	**0.0278**
5 N/O (2 Im)	2.04(1)	7(1)	-12(2)	26.26	2.17	0.0528
5 N/O	2.02(2)	6(2)				
2 N/O (2 Im)	2.17(4)	5(5)	-12(2)	27.13	2.69	0.0545
7 N/O (2 Im)	2.04(1)	10(1)	-13(2)	30.27	2.5	0.0608
4 N/O	2.03(2)	3(1)				
1 N/O (1 Im)	2.18(3)	0(3)	-9(2)	25.47	2.53	0.0512
6 N/O (1 Im)	2.04(1)	8(1)	-13(2)	32.51	2.69	0.0653
5 N/O	2.03(1)	5(1)				
1 N/O	2.17(3)	0(2)	-12(2)	24.68	2.45	0.0496

(1 Im)						
5 N/O (1 Im)	2.05(1)	7(1)	-11(2)	38.71	3.2	0.0778
6 N/O 1 N/O (1 Im)	2.03(2) 2.19(4)	7(1) 2(4)	-12(2)	35.23	3.5	0.0708
7 N/O (1 Im)	2.04(1)	10(1)	-13(2)	38.84	3.21	0.0781
3 N/O 3 N/O (3 Im)	1.98(1) 2.13(2)	2(1) 4(2)	-12(2)	18.07	1.79	0.0363
6 N/O (3 Im)	2.03(1)	8(1)	-14(2)	22.99	1.9	0.0462
2 N/O 3N/O (3 Im)	1.97(1) 2.11(1)	0(1) 2(1)	-12(2)	18.71	1.85	0.0376
5 N/O (3 Im)	2.03(1)	6(1)	-14(2)	25.71	2.13	0.0517
4 N/O 3 N/O (3 Im)	2.00(2) 2.14(4)	5(2) 8(6)	-12(2)	24.81	2.46	0.0498
7 N/O (3 Im)	2.04(1)	9(1)	-14(2)	27.31	2.26	0.0549
2 N/O 1 N/O (2 Im) 1 O 1 O 1 C 1 C	2.0(1) 2.2(1) 1.93(7) 2.04(7) 2.71(7) 2.80(7)	2(2) 0(2) 5(2)	-6(16)	37.47	4.64	0.0753
3 N/O (2 Im) 1 O 1 O 1 C	2.14(4) 1.93(2) 2.04(2) 2.71(2)	9(3) 2(2)	-2(3)	28.53	2.83	0.0573

1	C	2.80(2)

Table S8. EXAFS analysis of Fe(JMJD2C)-αKG (k = 2 – 12.5 Å^{-1} fit in r-space with values r = 1 – 4.5). Fits included in the text Table 1 are shown in **bold type**.

Shell	r(Å)	σ^2(Å^2)	ΔE_0(eV)	χ^2	Red χ^2	R
2 N/O	2.06(2)	2(1)	-10(4)	237.8	11.85	0.2844
3 N/O	2.06(2)	4(1)	-11(3)	165	8.22	0.1973
4 N/O	2.06(1)	6(1)	-12(2)	139.29	6.94	0.1666
5 N/O	2.06(1)	8(1)	-12(2)	140.89	7.02	0.1685
6 N/O	2.05(2)	10(1)	-13(2)	157.86	7.86	0.1888
7 N/O	2.05(2)	12(1)	-14(2)	182.66	9.1	0.2184
2 S	2.15(2)	6(1)	-31(5)	223.82	11.15	0.2677
3 S	2.15(2)	9(1)	-31(4)	180.92	9.01	0.2164
4 S	2.15(2)	12(1)	-31(4)	168.09	8.37	0.201
5 S	2.15(2)	14(1)	-32(4)	169.24	8.34	0.2024
6 S	2.16(2)	16(1)	-32(4)	177.14	8.82	0.2118
7 S	2.16(3)	17(1)	-32(4)	188.25	9.38	0.2251
2 N/O	2.01(3)	1(3)				
1 N/O	2.15(4)	0(5)	-10(3)	151.71	8.39	0.1814
2 N/O	2.00(2)	2(3)				
2 N/O	2.15(3)	3(2)	-11(3)	132.22	7.31	0.1581
3 N/O	2.01(2)	3(2)				
1 N/O	2.15(4)	4(4)	-11(3)	133.53	7.39	0.1597
4 N/O	2.06(2)	6(2)				
1 N/O	2.20(2)	8(3)	-10(3)	136.37	7.54	0.1631
3 N/O	2.05(2)	5(2)				
2 N/O	2.1(1)	15(1)	-10(3)	137.1	7.59	0.1639
5 N/O	2.07(2)	8(1)				
1 N/O	2.4(1)	15(24)	-11(2)	138.8	7.68	0.166

4 N/O	2.07(2)	6(1)				
2 N/O	2.3(1)	27(31)	-9(3)	138.07	7.64	0.1651
3 N/O	2.06(2)	5(1)				
3 N/O	2.2(1)	28(20)	-9(4)	142.43	7.88	0.1703
6 N/O	2.07(2)	10(1)				
1 N/O	2.39(9)	11(14)	-12(2)	149.24	8.26	0.1785
5 N/O	2.07(2)	8(1)				
2 N/O	2.36(8)	21(19)	-10(2)	139.79	7.73	0.1672
4 N/O	2.07(2)	6(1)				
3 N/O	2.31(9)	32(26)	-8(3)	139.11	7.7	0.1663
2 S	2.16(2)	7(1)				
1 S	0.30(3)	28(12)	-29(4)	186.26	10.31	0.2228
2 S	2.14(3)	6(3)				
2 S	2.27(6)	11(6)	-26(5)	157.54	8.72	0.1884
3 S	No fit					
1 S						
4 S	No fit					
1 S						
3 S	2.15(3)	9(1)				
2 S	1.5(3)	47(47)	-32(6)	178.54	9.88	0.2135
5 S	No fit					
1 S						
4 S	2.17(2)	10(2)				
2 S	2.37(5)	13(6)	-25(4)	149.35	8.26	0.1786
3 S	2.33(6)	17(8)				
3 S	2.16(2)	9(2)	-25(4)	149.51	8.27	0.1788
6 S	2.17(2)	16(1)				
1 S	2.98(2)	4(2)	-29(3)	117.77	6.51	0.1408
5 S	No fit					
2 S						

4 S	2.15(2)	11(1)				
3 S	1.2(5)	73(138)	-32(5)	165.39	9.15	0.1978
2 N/O	2.01(3)	3(2)				
1 S	2.25(4)	7(3)	-17(4)	166.59	9.22	0.1992
1 N/O	1.4(1)	13(14)				
2 S	2.15(3)	6(1)	-31(6)	217.86	12.06	0.2605
2 N/O	2.01(3)	4(2)				
2 S	2.24(5)	13(4)	-19(4)	158.18	8.75	0.1892
3 N/O	2.04(2)	5(1)				
1 S	2.29(7)	14(8)	-14(3)	147.1	8.14	0.1759
1 N/O	1.99(4)	3(3)				
3 S	2.20(4)	13(3)	-24(5)	164.36	9.09	0.1966
1 N/O 4 S	No fit					
4 N/O	2.07(2)	8(2)				
1 S	1.85(4)	20(10)	-7(2)	127.11	7.03	0.152
2 N/O	0.86(7)	7(7)				
3 S	2.15(2)	9(1)	-31(4)	175.45	9.71	0.2098
3 N/O	2.30(5)	0(4)				
2 S	2.27(4)	3(3)	-1(5)	393.95	21.8	0.4712
5 N/O	2.06(2)	9(2)				
1 S	1.89(6)	20(14)	-9(3)	131.59	7.28	0.1574
1 N/O 5 S	No fit					
4 N/O	2.07(1)	6(1)				
2 S	2.62(6)	25(10)	-9(2)	121.47	6.72	0.1453
2 N/O	1.8(1)	28(43)				
4 S	2.15(3)	11(2)	-33(6)	164.42	9.1	0.1966
3 N/O	2.06(1)	4(1)				
3 S	2.5(1)	39(18)	-9(3)	136.07	7.53	0.1627
6 N/O	2.05(2)	9(2)				

1 S	1.9(1)	18(14)	-11(3)	137.78	7.62	0.1648
1 N/O 6 S	No fit					
5 N/O 2 S	2.07(2) 1.91(4)	9(2) 26(11)	-7(3)	127.8	7.07	0.1528
2 N/O 5 S	1.61(4) 2.7(1)	23(9) 63(39)	10.9(4)	520.39	28.8	0.6224
4 N/O 3 S	2.07(1) 2.62(5)	6(1) 30(10)	-8(2)	118.63	6.56	0.1419
3 N/O 4 S	2.07(1) 2.55(9)	4(1) 42(15)	-9(2)	131.76	7.29	0.1576
2 N/O 2 N/O (2 Im)	1.99(2) 2.11(2)	2(2) 2(2)	-13(2)	23.49	2.33	0.0281
3 N/O 1 N/O (1 Im)	2.12(2) 1.98(2)	5(2) 0(2)	-10(2)	32.98	3.27	0.0394
3 N/O 1 N/O (3 Im)	2.00(1) 2.12(3)	4(2) 1(3)	-16(2)	26.22	2.6	0.0313
4 N/O 1 N/O (1 Im)	2.09(4) 2.00(3)	10(3) 2(3)	-12(3)	41.72	4.14	0.0499
4 N/O 1 N/O (4 Im)	2.06(1) 1.90(8)	6(1) 12(14)	-19(2)	28.4	2.82	0.0339
3 N/O 2 N/O (3 Im)	2.04(2) 2.00(8)	5(1) 13(8)	-17(2)	25.12	2.49	0.03
3 N/O 2 N/O	**2.01(2) 2.17(4)**	**3(2) 9(7)**	**-9(2)**	**20.94**	**2.08**	**0.025**

(2 Im)						
5 N/O 1 N/O (1 Im)	2.14(4) 2.00(2)	16(4) 1(2)	-10(2)	75.31	7.48	0.09
5 N/O 1 N/O (5 Im)	2.02(1) 2.45(6)	8(1) 11(11)	-20(2)	51.56	5.12	0.0616
4 N/O 2 N/O (4 Im)	2.06(1) 1.91(9)	6(1) 26(18)	-19(2)	29.99	2.98	0.0358
4 N/O 2 N/O (2 Im)	2.04(1) 2.0(3)	6(1) 13(8)	-15(3)	22.77	2.26	0.0272
3 N/O 3 N/O (3 Im)	2.04(1) 2.01(8)	5(1) 23(8)	-17(3)	27.28	2.71	0.0326
5 N/O 2 N/O (2 Im)	2.06(2) 2.34(8)	8(1) 18(16)	-10(3)	36.77	3.65	0.044
5 N/O 2 N/O (5 Im)	2.03(1) 2.71(3)	8(1) 11(2)	-18(2)	60.18	5.98	0.0719
4 N/O 3 N/O (4 Im)	2.03(1) 2.0(1)	6(1) 39(22)	-18(3)	23.63	2.34	0.0284
4 N/O 3 N/O (3 Im)	2.0(1) 2.03(1)	31(9) 5(1)	-17(3)	29.61	2.94	0.0354
6 N/O 1 N/O (1 Im)	2.04(2) 2.09(7)	1(2) 20(4)	-12(5)	67.94	6.75	0.0812
2 N/O	2.06(2)	0(1)	-1(3)	24.16	2.4	0.0311

(2 Im)						
1 O	1.93(3)	2(2)				
1 O	2.14(3)					
1 C	2.65(3)					
1 C	2.75(3)					
3 N/O	**2.05(2)**	**4(1)**	**-2(4)**	**12.89**	**1.28**	**0.0154**
(2 Im)						
1 O	**1.92(7)**	**6(4)**				
1 O	**2.13(7)**					
1 C	**2.64(7)**					
1 C	**2.74(7)**					
2 N/O	2.01(2)	2(2)	-4(5)	41.44	5.14	0.0495
1 N/O	2.15(3)	0(2)				
(2 Im)						
1 O	1.93(2)	20(17)				
1 O	2.14(2)					
1 C	2.65(2)					
1 C	2.75(2)					
4 N/O	2.05(2)	6(1)	-4(4)	35.24	3.5	0.0421
(2 Im)						
1 O	1.84(1)	18(19)				
1 O	2.05(1)					
1 C	2.56(1)					
1 C	2.66(1)					
2 N/O	2.01(3)	3(3)	-6(8)	40.93	5.07	0.0489
2 N/O	2.13(7)	5(4)				
(2 Im)						
1 O	1.99(3)	11(40)				
1 O	2.20(3)					
1 C	2.71(3)					
1 C	2.81(3)					
3 N/O	2.03(2)	4(2)	-3(7)	37.37	4.63	0.0447
1 N/O	2.16(6)	3(5)				
(2 Im)						
1 O	1.87(4)	42(20)				
1 O	2.08(4)					
1 C	2.59(4)					
1 C	2.69(4)					

Table S9. EXAFS analysis of Fe(JMJD2C)-αKG + substrate (k = 2 – 12.5 Å^{-1} fit in r-space with values r = 1 – 4.5). Fits included in the text Table 1 are shown in **bold type**.

Shell	r(Å)	σ^2(Å^2)	ΔE_0(eV)	χ^2	Red χ^2	R
2 N/O	2.17(2)	1(1)	-7(3)	2424.86	114.55	0.2855
3 N/O	2.17(1)	3(1)	-8(2)	1665.95	78.7	0.1961
4 N/O	2.16(1)	5(1)	-9(2)	1386.4	65.49	0.1632
5 N/O	2.16(1)	7(1)	-10(2)	1388.75	65.6	0.1635
6 N/O	2.16(1)	9(1)	-11(2)	1551.6	73.3	0.1827
7 N/O	2.15(2)	11(1)	-12(2)	1789.17	84.95	0.2117
2 S	2.27(2)	6(1)	-24(4)	1948.89	92.07	0.2294
3 S	2.26(2)	8(1)	-25(3)	1582.75	74.77	0.1863
4 S	2.26(2)	11(1)	-26(3)	1528.99	72.23	0.18
5 S	2.26(2)	13(1)	-27(3)	1607.81	75.95	0.1893
6 S	3(1)	134(365)	10(5)	8333.2	393.68	0.9812
7 S	2.26(2)	17(1)	-28(3)	1897.24	89.63	0.2233
2 N/O 1 N/O	2.13(5) 2.21(6)	3(6) 0(4)	-9(3)	1523.58	79.48	0.1794
2 N/O 2 N/O	2.06(2) 2.22(2)	2(2) 3(2)	-11(2)	1120.84	58.47	0.1319
3 N/O 1 N/O	2.19(1) 2.04(2)	1(1) 0(2)	-10(2)	1175.12	61.31	0.1383
4 N/O 1 N/O	No fit					
3 N/O	2.06(2)	5(3)				

2 N/O	2.22(2)	3(2)	-12(2)	1147.17	59.85	0.135
5 N/O	2.2(2)	37(15)				
1 N/O	2.17(2)	0(2)	-7(8)	2630.75	137.25	0.3097
4 N/O	2.18(1)	5(1)				
2 N/O	2.49(5)	14(9)	-6(2)	1272.69	66.4	0.1498
3 N/O	2.04(3)	9(4)				
3 N/O	2.19(2)	3(2)	-14(2)	1263.43	65.91	0.1487
6 N/O	2.16(2)	9(1)				
1 N/O	6(2)	0(93)	-11(2)	1549.6	80.84	0.1824
5 N/O	2.18(1)	7(1)				
2 N/O	2.50(2)	7(3)	-7(2)	1100.45	57.41	0.1295
4 N/O	2.03(4)	14(6)				
3 N/O	2.19(2)	4(1)	-15(2)	1367.48	71.34	0.161
2 S	2.26(2)	6(1)				
1 S	0.30(3)	30(14)	-28(4)	1487.25	77.59	0.1751
2 S	No fit					
2 S						
3 S	No fit					
1 S						
4 S	No fit					
1 S						
3 S	2.26(2)	8(1)				
2 S	1.6(1)	39(17)	-26(4)	1441.82	75.22	0.1697
5 S	2.30(2)	12(1)				
1 S	2.56(2)	5(2)	-21(3)	1087.15	56.72	0.128
4 S	2.30(2)	9(1)				
2 S	2.53(3)	11(3)	-19(3)	1138.31	59.38	0.134
3 S	3.2(4)	69(117)				
3 S	1.94(3)	22(3)	5(3)	3248.35	169.47	0.3824
6 S	2.30(2)	14(1)				
1 S	2.56(2)	4(2)	-22(2)	1049.68	54.76	0.1235

5 S	2.25(2)	13(1)				
2 S	0.10(4)	207(38)	-29(4)	1551.2	80.93	0.1826
4 S	2.26(2)	11(1)				
3 S	1.5(1)	52(33)	-27(4)	1471.79	76.78	0.1733
2 N/O	2.19(1)	2(1)				
1 S	1.88(3)	15(4)	-4(2)	1317.69	68.74	0.1551
1 N/O	2.19(3)	0(2)				
2 S	1.8(2)	56(31)	-4(8)	3405.95	177.69	0.401
2 N/O	2.79(8)	15(14)				
2 S	1.97(2)	15(2)	9(2)	2650.37	138.27	0.312
3 N/O	2.18(1)	4(1)				
1 S	1.86(5)	22(7)	-6(2)	1235.2	64.44	0.1454
1 N/O	1.35(8)	26(23)				
3 S	1.94(3)	20(3)	4(3)	2811.77	146.69	0.331
1 N/O	1.3(1)	29(33)				
4 S	1.93(3)	26(3)	3(3)	3148.12	164.24	0.3706
4 N/O	2.17(1)	5(1)				
1 S	2.73(7)	18(12)	-8(2)	1236.4	64.5	0.1455
2 N/O	2.19(1)	2(1)				
3 S	1.92(4)	34(5)	-2(2)	1197.6	62.48	0.141
3 N/O	2.18(1)	4(1)				
2 S	1.90(6)	34(9)	-5(2)	1217.25	63.5	0.1433
5 N/O	2.17(1)	7(1)				
1 S	1.1(2)	48(53)	-9(2)	1340.86	69.95	0.1578
1 N/O	0.14(5)	744(209)				
5 S	1.93(4)	34(5)	4(3)	3635.23	189.66	0.428
4 N/O	2.1(1)	20(6)				
2 S	2.28(2)	7(2)	-22(7)	1319.94	68.86	0.1554
2 N/O	2.76(9)	14(15)				
4 S	1.95(3)	28(4)	6(3)	3229.22	168.47	0.3802

3 N/O 3 S	2.18(1) 1.93(5)	4(1) 41(9)	-4(2)	1188.62	62.01	0.1399
6 N/O 1 S	No fit					
1 N/O 6 S	No fit					
5 N/O 2 S	2.17(2) 2.0(2)	7(1) 56(80)	-9(5)	1354.01	70.64	0.1594
2 N/O 5 S	1.2(1) 1.92(4)	58(49) 30(4)	2(3)	3439.03	179.42	0.4049
4 N/O 3 S	2.18(1) 1.96(7)	6(1) 50(23)	-6(3)	1256.29	65.54	0.1479
3 N/O 4 S	2.19(1) 1.96(4)	4(1) 45(9)	-3(2)	1155.57	60.28	0.136
3 N/O 1 N/O (1 Im)	2.18(1) 2.04(2)	1(1) 0(2)	-11(2)	576.58	51.63	0.0678
2 N/O 2 N/O (2 Im)	2.08(3) 2.23(3)	4(5) 1(2)	-4(3)	512.2	45.86	0.0603
1 N/O 3 N/O (3 Im)	2.03(2) 2.19(1)	0(2) 1(1)	-11(2)	610.35	54.65	0.0718
4 N/O 1 N/O (1 Im)	2.16(1) 2.01(2)	3(1) 1(2)	-12(2)	491.76	44.03	0.0679
3 N/O 2 N/O (2 Im)	**2.19(2) 2.04(2)**	**2(1) 3(2)**	**-10(2)**	**366.51**	**32.42**	**0.0431**
2 N/O 3 N/O (3 Im)	2.21(1) 2.05(2)	1(1) 5(2)	-14(2)	446.54	39.98	0.0525
4 N/O	2.17(1)	5(1)	-9(2)	805.44	61.17	0.0948

(1 Im)						
4 N/O (2 Im)	2.17(1)	5(1)	-9(2)	729.18	55.37	0.0858
4 N/O (3 Im)	2.17(1)	5(1)	-9(2)	761.6	57.84	0.0896
5 N/O (1 Im)	2.16(1)	7(1)	-10(2)	847.58	64.37	0.0998
5 N/O (2 Im)	2.16(1)	7(1)	-10(2)	707.78	53.75	0.0833
5 N/O (3 Im)	2.16(1)	7(1)	-11(2)	725.95	55.13	0.0854
3 N/O (2 Im)	**2.16(1)**	**2(1)**	**-1(2)**	**275.68**	**24.69**	**0.0325**
1 O	**2.01(2)**	**2(2)**				
1 O	**2.22(2)**					
1 C	**2.73(2)**					
1 C	**2.83(2)**					
2 N/O	2.17(7)	6(6)	0(3)	395.77	43.17	0.0466
1 N/O (2 Im)	2.15(5)	3(3)				
1 O	2.03(3)	4(4)				
1 O	2.24(3)					
1 C	2.75(3)					
1 C	2.85(3)					

Table S10. EXAFS analysis of Ni(JMJD2C) (k = 2 – 12.5 Å^{-1} fit in r-space with values r = 1 – 4.5). Fits included in the text Table 1 are shown in **bold type**.

Shell	r(Å)	σ^2(Å^2)	ΔE_0(eV)	χ^2	Red χ^2	R
2 N/O	2.10(3)	0(2)	-1(5)	1255.73	59.32	0.4299
3 N/O	2.10(2)	1(1)	-2(3)	890.67	42.07	0.3049
4 N/O	2.10(1)	2(1)	-2(2)	664.08	31.37	0.2273
5 N/O	2.10(1)	3(1)	-3(2)	532.14	25.14	0.1822
6 N/O	2.10(1)	5(1)	-3(2)	471.45	22.27	0.1614
7 N/O	2.10(1)	6(1)	-4(2)	465.04	21.97	0.1592
8 N/O	2.10(1)	7(1)	-4(2)	499.44	23.59	0.171
2 S	2.19(2)	3(1)	-21(6)	1017.81	48.08	0.3485
3 S	2.19(2)	5(1)	-22(4)	759.53	35.88	0.26
4 S	2.19(2)	7(1)	-22(4)	625.12	29.53	0.214
5 S	2.19(2)	8(1)	-22(3)	563.29	26.61	0.1928
6 S	2.19(2)	10(1)	-23(3)	545.93	25.79	0.1869
7 S	2.19(2)	11(1)	-23(3)	556.16	26.27	0.1904
2 N/O	2.1(3)	1(21)				
1 N/O	2.1(5)	0(30)	-2(5)	871.75	45.48	0.2984
2 N/O	2.05(5)	0(6)				
2 N/O	2.14(5)	0(6)	-2(3)	610.27	31.83	0.2089
3 N/O	2.09(6)	2(8)				
1 N/O	2.2(2)	0(130	-2(3)	640.17	33.39	0.2192
4 N/O	2.12(3)	3(5)				
1 N/O	2.03(9)	0(7)	-3(2)	506.43	26.42	0.1734
3 N/O	2.06(3)	1(3)				
2 N/O	2.16(4)	0(4)	-3(2)	477.75	24.92	0.1635

5 N/O	2.10(1)	4(1)				
1 N/O	1.53(9)	19(18)	-1(2)	485.74	25.34	0.1663
4 N/O	2.06(2)	2(2)				
2 N/O	2.18(3)	0(3)	-3(2)	428.03	22.33	0.1465
3 N/O	2.04(2)	2(2)				
3 N/O	2.14(2)	3(2)	-3(2)	406.13	21.18	0.139
6 N/O	2.08(2)	4(2)				
1 N/O	2.18(6)	0(5)	-4(2)	449.05	23.42	0.1537
4 N/O	2.04(2)	3(2)				
3 N/O	2.16(2)	2(2)	-4(2)	434.93	22.69	0.1489
5 N/O	2.06(2)	3(2)				
2 N/O	2.18(3)	0(3)	-4(2)	439.79	22.94	0.1505
2 S	2.23(3)	2(2)				
1 S	2.12(3)	0(3)	-21(5)	590.46	30.8	0.2276
2 S	2.13(2)	1(2)				
2 S	2.25(2)	1(2)	-22(4)	562.79	29.36	0.1927
3 S	2.23(2)	3(2)				
1 S	2.11(3)	0(2)	-21(4)	559.15	29.17	0.1914
4 S	No fit					
1 S						
3 S	2.14(2)	4(2)				
2 S	2.27(3)	3(3)	-22(4)	542.38	28.29	0.1857
5 S	2.19(2)	8(1)				
1 S	12(24)	0(4)	-22(3)	563.29	29.38	0.1928
4 S	2.18(3)	7(3)				
2 S	2.3(1)	12(19)	-20(5)	531.61	27.73	0.182
3 S	2.17(5)	6(3)				
3 S	2.26(9)	11(12)	-20(5)	530.88	27.69	0.1817
6 S	2.19(5)	10(1)				
1 S	2(3)	45(580)	-23(18)	540.51	28.2	0.185

4 S	2.18(2)	8(1)				
3 S	3.47(9)	15(12)	-24(3)	505.81	26.38	0.1731
5 S	2.19(2)	8(1)				
2 S	1.3(8)	80(268)	-23(4)	560.1	29.22	0.1917
2 N/O	2.04(3)	0(2)				
1 S	2.27(3)	1(2)	-8(5)	712.82	37.19	0.244
1 N/O	2.45(7)	0(5)				
2 S	2.17(3)	3(1)	-24(7)	881.71	46	0.3019
2 N/O	2.01(2)	0(2)				
2 S	2.24(2)	3(1)	-14(4)	555.26	28.96	0.1901
3 N/O	2.03(2)	0(1)				
1 S	2.27(2)	0(1)	-10(3)	528.25	27.56	0.1808
1 N/O	2.71(8)	2(8)				
3 S	2.19(2)	5(1)	-20(4)	707.12	36.89	0.2421
4 N/O	2.05(2)	2(1)				
1 S	2.28(2)	1(2)	-9(3)	486.54	25.38	0.1665
1 N/O	0.1(1)	244(232)				
4 S	2.19(2)	7(1)	-23(4)	619.79	32.33	0.2122
2 N/O	2.01(3)	2(2)				
3 S	2.24(2)	6(2)	-15(4)	536.47	27.98	0.1836
3 N/O	2.03(2)	2(2)				
2 S	2.26(2)	4(2)	-12(3)	522.33	27.25	0.1788
5 N/O	2.11(1)	3(1)				
1 S	2.62(4)	6(4)	-1(2)	433.72	22.62	0.1485
1 N/O 5 S	No fit					
4 N/O	2.05(3)	4(2)				
2 S	2.26(3)	7(3)	-11(3)	508.55	26.53	0.1741
2 N/O	2.02(4)	3(3)				
4 S	2.28(3)	9(2)	-16(4)	533.72	27.84	0.1827
3 N/O	2.03(3)	4(2)				

3 S	2.24(3)	8(2)	-14(4)	526.63	27.47	0.1803
6 N/O	2.11(1)	6(1)				
1 S	1.87(4)	13(6)	0(2)	402.68	21	0.1378
1 N/O 6 S	No fit					
5 N/O	2.07(2)	5(2)				
2 S	2.26(4)	10(5)	-9(3)	498.54	26.01	0.1707
2 N/O	2.72(5)	5(6)				
5 S	2.20(2)	8(1)	-20(3)	469.55	24.49	0.1607
4 N/O	2.06(3)	5(2)				
3 S	2.25(4)	11(4)	-12(4)	518.07	27.02	0.1773
3 N/O	0.9(4)	71(274)				
4 S	2.19(2)	7(1)	-22(4)	621.9	32.44	0.2129
5 N/O	2.13(2)	4(2)				
1 N/O (1 Im)	2.00(4)	0(3)	-1(2)	257.16	23.02	0.088
6 N/O (1 Im)	2.09(1)	4(1)	6(2)	259.93	19.74	0.089
4 N/O	2.12(2)	2(2)				
1 N/O (1 Im)	2.00(4)	0(4)	-1(2)	266.92	23.9	0.0913
5 N/O (1 Im)	2.09(1)	3(1)	6(2)	350.03	26.58	0.1198
6 N/O	2.12(2)	5(2)				
1 N/O (1 Im)	2.00(4)	0(3)	-2(2)	252.55	22.61	0.0864
7 N/O (1 Im)	2.09(1)	5(1)	7(2)	206.17	15.65	0.0705
3 N/O	2.16(1)	1(1)				
3 N/O (3 Im)	2.02(1)	1(1)	1(1)	126.38	11.31	0.0432
6 N/O	2.09(1)	4(1)	6(1)	144.74	10.99	0.0495

(3 Im)						
2 N/O	2.16(2)	0(2)				
3 N/O (3 Im)	2.03(1)	1(1)	1(1)	170.03	15.22	0.0582
5 N/O (3 Im)	2.08(1)	3(1)	5(2)	266.67	20.25	0.0913
4 N/O	2.13(3)	5(2)				
3 N/O (3 Im)	2.04(3)	4(2)	0(1)	182.94	16.38	0.0626
7 N/O (3 Im)	2.09(1)	5(1)	6(1)	152.08	11.55	0.052
4 N/O	2.14(1)	2(1)				
2 N/O (2 Im)	2.01(1)	1(1)	0(1)	152.48	13.65	0.0522
6 N/O (2 Im)	**2.09(1)**	**5(1)**	**6(1)**	**103.87**	**7.88**	**0.0355**
3 N/O	2.15(1)	1(1)				
2 N/O (2 Im)	2.02(1)	0(2)	1(1)	153.88	13.79	0.0526
5 N/O (2 Im)	2.08(1)	3(1)	6(2)	257.48	19.55	0.0881
5 N/O	2.13(2)	5(2)				
2 N/O (2 Im)	2.02(4)	3(3)	-1(2)	167.78	15.02	0.0574
7N(2Im)	2.08(1)	5(1)	5(1)	170.1	12.91	0.0582
4 N/O (2 Im)	2.15(2)	4(2)	0(2)	150.72	13.49	0.0581
1 O	1.97(3)	3(2)				
1 O	2.08(3)					
1 C	2.75(3)					
1 C	2.84(3)					
3 N/O	2(1)	2(28)	-2(4)	150.65	16.43	0.0515
1 N/O (2 Im)	2.1(5)	4(41)				

1 O	1.96(3)	7(6)				
1 O	2.07(3)					
1 C	2.74(3)					
1 C	2.83(3)					
2 N/O	2(1)	4(77)	-1(4)	115.67	12.61	0.0396
2 N/O	2.2(9)	3(39)				
(2 Im)						
1 O	1.97(3)	8(7)				
1 O	2.08(3)					
1 C	2.75(3)					
1 C	2.84(3)					

Table S11. EXAFS analysis of Ni(JMJD2C)-αKG (k = 2 – 12.5 Å^{-1} fit in r-space with values r = 1 – 4.5). Fits included in the text Table 1 are shown in **bold type**.

Shell	r(Å)	σ^2(Å^2)	ΔE_0(eV)	χ^2	Red χ^2	R
2 N/O	2.10(2)	0(2)	-1(5)	993.56	46.93	0.3889
3 N/O	2.10(2)	1(1)	-1(3)	683.45	32.28	0.2675
4 N/O	2.10(1)	3(1)	-2(2)	496.2	23.44	0.1942
5 N/O	2.09(1)	4(1)	-3(2)	394.99	18.66	0.1546
6 N/O	2.09(1)	5(1)	-3(1)	357.33	16.88	0.1398
7 N/O	2.09(1)	6(1)	-4(1)	366.68	17.32	0.1435
2 S	2.19(2)	3(1)	-21(6)	810.22	38.27	0.3171
3 S	2.18(2)	5(1)	-21(4)	596.72	28.19	0.2335
4 S	2.18(2)	7(1)	-22(3)	490.33	23.16	0.1919
5 S	2.18(2)	9(1)	-22(3)	445.32	21.03	0.1743
6 S	2.18(2)	10(1)	-23(3)	437.08	20.64	0.171
7 S	2.18(2)	12(1)	-23(3)	451.14	21.31	0.1765
2 N/O 1 N/O	2.12(7) 2.0(2)	0(8) 0(15)	-2(4)	660.58	34.46	0.2585
2 N/O 2 N/O	2.01(5) 2.16(4)	1(6) 0(5)	-3(3)	453.73	23.67	0.1776
3 N/O 1 N/O	2.07(5) 2.1(1)	2(7) 0(8)	-2(3)	473.26	24.69	0.1852
4 N/O 1 N/O	2.11(2) 2.00(5)	2(2) 0(5)	-3(2)	363	18.93	0.142
3 N/O 2 N/O	2.01(3) 2.17(3)	2(3) 0(3)	-3(2)	352.16	18.37	0.1378
5 N/O 1 N/O	2.03(2) 2.19(6)	5(3) 0(4)	-4(2)	335.69	17.51	0.1314
4 N/O	2.02(2)	3(2)				

2 N/O	2.17(3)	2(2)	-5(2)	323.81	16.89	0.1267
3 N/O	2.00(2)	3(2)				
3 N/O	2.16(2)	2(2)	-4(2)	314.04	16.38	0.1229
6 N/O	2.09(1)	5(1)				
1 N/O	3.96(8)	0(8)	-3(2)	327.88	17.1	0.1283
4 N/O	2.00(2)	3(2)				
3 N/O	2.15(2)	2(2)	-6(2)	349.45	18.23	0.1367
5 N/O	2.01(2)	4(2)				
2 N/O	2.17(2)	2(2)	-6(2)	328.53	18.18	0.1364
2 S	2.21(2)	1(2)				
1 S	2.08(3)	0(2)	-24(5)	533.95	27.85	0.209
2 S	2.22(3)	2(2)				
2 S	2.11(3)	3(2)	-24(4)	464.41	24.23	0.1817
3 S	2.20(2)	4(2)				
1 S	2.07(3)	1(2)	-24(4)	462.24	24.11	0.1809
4 S	2.18(2)	7(1)				
1 S	1.5(2)	34(50)	-23(4)	482.77	25.18	0.1889
3 S	2.13(4)	6(4)				
2 S	2.24(4)	4(4)	-23(4)	439.55	22.39	0.172
5 S	No fit					
1 S						
4 S	2.19(2)	7(2)				
2 S	2.33(9)	14(16)	-19(4)	414.02	21.6	0.162
3 S	2.18(2)	6(2)				
3 S	2.28(9)	16(12)	-19(5)	417.84	21.8	0.1635
6 S	2.16(2)	10(1)				
1 S	0.96(5)	44(25)	-28(5)	382.25	19.94	0.1496
4 S	2.20(2)	7(1)				
3 S	2.36(5)	16(9)	-17(3)	384.49	20.06	0.1505
2 N/O	2.00(3)	0(2)				
1 S	2.24(2)	0(1)	-13(5)	546.73	28.52	0.214

1 N/O 2 S	1.95(4) 2.20(2)	0(3) 3(1)	-20(5)	532.73	27.79	0.2085
2 N/O 2 S	1.98(3) 2.22(2)	2(2) 3(1)	-17(4)	456.8	23.83	0.1788
3 N/O 1 S	2.02(2) 2.25(2)	2(2) 1(1)	-11(4)	452.07	23.58	0.1769
1 N/O 3 S	0.9(2) 2.18(2)	4(6) 6(1)	-22(4)	583.14	30.42	0.2282
1 N/O 4 S	0.10(6) 2.18(2)	250(205) 7(1)	-23(4)	483.43	25.22	0.1892
4 N/O 1 S	2.04(2) 2.26(2)	4(2) 2(2)	-10(3)	403.36	21.04	0.1578
2 N/O 3 S	0.9(1) 2.18(2)	6(5) 6(1)	-22(4)	579.72	30.24	0.2269
3 N/O 2 S	2.00(3) 2.23(2)	4(2) 4(2)	-15(4)	430.61	22.46	0.1685
5 N/O 1 S	2.10(1) 2.61(3)	4(1) 7(4)	-2(1)	309.92	16.16	0.1213
1 N/O 5 S	No fit					
4 N/O 2 S	2.04(4) 2.24(3)	6(3) 7(3)	-12(4)	416.19	21.17	0.1629
2 N/O 4 S	1.28(9) 2.18(2)	11(10) 7(1)	-23(4)	492.77	25.7	0.1928
3 N/O 3 S	2.02(5) 2.22(3)	7(4) 8(2)	-16(4)	432.2	22.54	0.1691
6 N/O 1 S	2.10(1) 2.60(3)	5(1) 6(4)	-2(1)	268.19	13.99	0.1049
1 N/O 6 S	No fit					

5 N/O 2 S	2.07(2) 2.24(4)	6(3) 11(6)	-9(3)	401.37	20.94	0.1571
2 N/O 5 S	1.8(2) 2.18(2)	33(64) 9(1)	-23(5)	434.51	22.66	0.17
4 N/O 3 S	2.05(3) 2.23(3)	7(4) 10(4)	-13(4)	425.36	22.19	0.1665
3 N/O 4 S	No fit					
4 N/O 2 N/O (4 Im)	2.00(2) 2.15(2)	4(1) 2(2)	-1(2) -2(2)	147.12	13.17	0.0575
3 N/O 3 N/O (3 Im)	1.98(1) 2.12(1)	2(1) 1(1)	-3(1)	159.7	14.3	0.0625
2 N/O 4 N/O (2 Im)	**1.98(4) 2.13(2)**	**3(2) 4(4)**	**-3(2)**	**117.21**	**10.49**	**0.0458**
1 N/O 5 N/O (1 Im)	1.96(3) 2.11(1)	0(2) 3(1)	-3(1) -3(2)	166.15	14.87	0.065
5 N/O 1 N/O (5 Im)	2.02(2) 2.18(4)	5(2) 0(3)	2(3)	164.22	14.7	0.0642
6 N/O (6 Im)	2.08(1)	4(1)	7(3)	259.7	19.72	0.1016
6 N/O (5 Im)	2.08(1)	5(1)	6(2)	208.09	15.8	0.0814
6 N/O (4 Im)	2.08(1)	5(1)	6(2)	203.08	15.42	0.0794
6 N/O (3 Im)	2.08(1)	5(1)	6(2)	200.49	15.22	0.0784
6 N/O (2 Im)	2.08(1)	5(1)	6(2)	204.97	15.56	0.0802

6 N/O (1 Im)	2.08(1)	5(1)	6(2)	230.83	17.53	0.0903
2 N/O 2 N/O (2 Im) 1 O 1 O 1 C 1 C	2.01(4) 2.14(2)	3(6) 2(2) 8(9)	0(2)	120.05	13.09	0.0469
4 N/O **(2 Im)** **1 O** **1 O** **1 C** **1 C**	**2.04(2)** **2.09(3)** **2.14(3)** **2.76(3)** **2.78(3)**	**4(3)** **3(3)**	**8(2)**	**88.19**	**7.89**	**0.0345**
3 N/O 1 N/O (2 Im) 1 O 1 O 1 C 1 C	2.04(5) 2.15(4) 2.01(9) 2.06(9) 2.68(9) 2.70(9)	4(2) 0(4) 7(3)	3(3)	153.53	16.74	0.06

Table S12. EXAFS analysis of Ni(JMJD2C)-αKG + substrate (k = 2 – 12 Å^{-1} fit in r-space with values r = 1 – 4.5). Fits included in the text Table 1 are shown in **bold type**.

Shell	r(Å)	σ^2(Å^2)	ΔE_0(eV)	χ^2	Red χ^2	R
2 N/O	2.10(3)	0(2)	1(5)	690.05	36.39	0.3868
3 N/O	2.08(2)	0(1)	-3(3)	389.61	20.54	0.2184
4 N/O	2.08(1)	1(1)	-3(2)	273.88	14.44	0.1535
5 N/O	2.09(1)	2(1)	-3(2)	220.66	11.63	0.1237
6 N/O	2.09(1)	3(1)	-4(1)	207.96	10.96	0.1165
7 N/O	2.09(1)	5(1)	-4(1)	225.16	11.87	0.1262
2 S	2.17(2)	2(1)	-24(6)	522.74	27.57	0.293
3 S	2.17(2)	4(1)	-23(4)	410.14	21.64	0.2299
4 S	2.18(2)	6(1)	-23(4)	360.79	19.02	0.2022
5 S	2.18(2)	8(1)	-23(3)	346.22	18.26	0.194
6 S	2.18(2)	9(1)	-23(3)	351.57	18.54	0.197
7 S	2.19(2)	11(1)	-23(3)	368.29	19.42	0.2064
2 N/O 1 N/O	2.08(6) 2.1(3)	0(3) 6(36)	-1(6)	471.44	27.79	0.2642
2 N/O 2 N/O	2.1(3) 2.1(3)	1(25) 0(9)	-2(3)	265.63	15.66	0.1489
3 N/O 1 N/O	2.07(8) 2.1(3)	0(7) 0(25)	-3(3)	264.01	15.56	0.148
4 N/O 1 N/O	2.07(2) 2.18(8)	1(3) 0(10)	-3(2)	205.38	12.11	0.1151
3 N/O 2 N/O	2.06(4) 2.16(7)	0(3) 0(10)	-2(2)	202.82	11.95	0.1137
5 N/O 1 N/O	2.08(1) 2.23(5)	1(1) 0(6)	-2(2)	188.86	11.13	0.1058
4 N/O	2.07(1)	2(2)				

2 N/O	2.19(3)	4(4)	-2(2)	183.9	10.84	0.103
3 N/O	2.06(3)	2(2)				
3 N/O	2.16(4)	7(4)	-2(2)	185.41	10.93	0.1039
6 N/O	2.09(1)	3(1)				
1 N/O	2.27(6)	1(6)	-2(2)	198.2	11.68	0.1111
4 N/O	2.08(1)	1(1)				
3 N/O	2.20(5)	9(9)	-2(2)	194.45	11.46	0.109
5 N/O	2.08(1)	2(1)				
2 N/O	2.23(6)	9(7)	-2(2)	194.79	11.48	0.1092
2 S	2.15(3)	0(2)				
1 S	2.28(6)	0(5)	-21(6)	368.19	21.7	0.2064
2 S	2.15(2)	0(2)				
2 S	2.29(3)	2(3)	-18(4)	301.77	17.79	0.1691
3 S	2.18(2)	4(1)				
1 S	2.95(9)	7(11)	-22(4)	377.81	22.27	0.2118
4 S	2.17(2)	6(1)				
1 S	0.1(1)	210(63)	-24(4)	350.62	20.67	0.1965
3 S	2.17(2)	2(1)				
2 S	2.33(3)	3(3)	-17(3)	276.7	16.31	0.1551
5 S	No fit					
1 S						
4 S	2.19(2)	4(1)				
2 S	2.36(3)	4(3)	-17(3)	263.12	15.51	0.1475
3 S	2.18(2)	3(1)				
3 S	2.22(3)	7(4)	-16(3)	259.29	15.29	0.1453
6 S	2.15(2)	8(1)				
1 S	0.98(2)	23(6)	-34(4)	263.67	15.54	0.1478
4 S	2.19(2)	4(1)				
3 S	2.36(3)	8(3)	-16(3)	251.79	14.84	0.1411
5 S	2.18(2)	8(1)				
2 S	3.48(6)	6(6)	-24(3)	313.63	18.49	0.1758

2 N/O 1 S	2.06(4) 2.28(7)	0(3) 5(6)	-7(6)	445.96	26.29	0.25
1 N/O 2 S	1.40(3) 2.17(2)	2(3) 2(1)	-23(6)	456.04	26.88	0.2556
2 N/O 2 S	2.03(3) 2.24(4)	0(2) 5(3)	-13(5)	328.73	19.38	0.1842
3 N/O 1 S	2.08(2) 2.4(3)	0(1) 28(46)	-3(4)	344.31	20.3	0.193
1 N/O 3 S	2.53(7) 2.17(2)	0(6) 4(1)	-23(4)	351.36	20.71	0.1969
1 N/O 4 S	No fit					
4 N/O 1 S	2.07(1) 2.34(5)	1(1) 8(6)	-5(2)	226.3	13.34	0.1268
2 N/O 3 S	1.38(4) 2.17(2)	7(5) 4(1)	-23(5)	376.14	22.17	0.2108
3 N/O 2 S	2.06(2) 2.31(4)	0(1) 10(4)	-7(3)	253.19	14.92	0.1419
5 N/O 1 S	2.09(1) 2.5(2)	2(1) 23(27)	-3(2)	200.97	11.84	0.1126
1 N/O 5 S	No fit					
4 N/O 2 S	2.08(1) 2.38(8)	1(1) 20(10)	-5(2)	219.38	12.93	0.1229
2 N/O 4 S	No fit					
3 N/O 3 S	1.85(9) 2.17(2)	16(14) 4(1)	-26(6)	353.9	20.86	0.1984
6 N/O 1 S	2.09(1) 1.9(1)	4(1) 34(40)	-2(2)	204.88	12.08	0.1148

1 N/O	6(2)	0(187)				
6 S	2.18(2)	9(1)	-23(3)	350.69	20.67	0.1966
5 N/O	2.09(1)	2(1)				
2 S	2.5(1)	28(20)	-3(2)	190.2	11.21	0.1066
2 N/O	0.8(3)	28(269)				
5 S	2.18(2)	8(1)	-23(4)	343.22	20.23	0.1924
4 N/O	2.08(1)	1(1)				
3 S	2.4(1)	29(12)	-4(2)	210.03	12.38	0.1177
3 N/O	1.79(4)	11(7)				
4 S	2.16(2)	5(1)	-28(4)	310.38	18.3	0.174
4 N/O	2.06(1)	1(1)				
2 N/O (4 Im)	2.21(5)	4(4)	5(3)	78.86	8.8	0.0442
3 N/O	2.04(2)	2(2)				
3 N/O (3 Im)	2.15(3)	4(3)	1(2)	81.38	9.08	0.0456
2 N/O	2.04(2)	2(2)				
4 N/O (2 Im)	2.13(3)	5(3)	0(2)	86.9	9.69	0.0487
1 N/O	2.1(2)	6(67)				
5 N/O (1 Im)	2.09(4)	3(7)	-2(2)	126.38	14.1	0.0708
5 N/O	2.06(2)	2(1)				
1 N/O (5 Im)	2.21(6)	0(5)	4(3)	94.31	10.52	0.0528
6 N/O (6 Im)	2.08(1)	3(1)	6(2)	91.41	8.34	0.0512
6 N/O (5 Im)	2.08(1)	3(1)	6(1)	100.19	9.14	0.0561
6 N/O (4 Im)	2.08(1)	3(1)	5(2)	97.42	8.88	0.0546

6 N/O (3 Im)	2.07(1)	3(1)	4(2)	114.85	10.47	0.0643
6 N/O (2 Im)	**2.08(1)**	**3(1)**	**6(2)**	**85.34**	**7.78**	**0.0478**
6 N/O (1 Im)	2.08(1)	3(1)	6(2)	109.14	9.95	0.0611
2 N/O 2 N/O (2 Im) 1 O 1 O 1 C 1 C	2.04(6) 2.14(6) 2.00(1) 2.05(1) 2.67(1) 2.69(1)	0(5) 8(2) 11(6)	1(3)	45.5	6.55	0.0256
4 N/O (2 Im) 1 O 1 O 1 C 1 C	**2.07(1) 1.96(8) 2.01(8) 2.63(8) 2.65(8)**	**1(1) 10(9)**	**3(3)**	**52.44**	**5.85**	**0.0294**
3 N/O 1 N/O (2 Im) 1 O 1 O 1 C 1 C	2.05(3) 2.18(7) 1.96(1) 2.01(1) 2.63(1) 2.65(1)	9(3) 0(3) 12(2)	2(3)	43.8	6.3	0.0246

Table S13. Zn *K*-edge EXAFS analysis of Fe(JMJD2C) (k = 2 – 13.5 Å^{-1} fit in r-space with values r = 1 – 4.5). Fits included in the text Table 1 are shown in **bold type**.

Shell	r(Å)	σ^2(Å^2)	ΔE_0(eV)	χ^2	Red χ^2	R
2 N/O	2.23(2)	0(2)	5(4)	7875.74	353.64	0.3818
3 N/O	2.23(1)	0(1)	5(2)	4553.88	204.48	0.2207
4 N/O	2.23(1)	0(1)	5(1)	3265.62	146.63	0.1583
5 N/O	2.23(1)	1(1)	4(1)	3011.08	135.2	0.1459
6 N/O	2.23(1)	2(1)	4(1)	3347.81	150.32	0.1623
7 N/O	2.23(1)	3(1)	3(1)	4129.37	185.41	0.2001
2 S	2.33(1)	1.1(5)	-9(2)	2341.51	105.13	0.1135
3 S	2.33(1)	2.9(3)	-9(1)	809.69	36.35	0.0392
4 S	2.331(4)	4(.5(2)	-10(1)	442.01	19.84	0.0214
5 S	2.330(5)	5.9(3)	-11(1)	738.09	33.14	0.0357
6 S	2.329(7)	7.3(4)	-11(1)	1415.73	63.57	0.0686
7 S	2.33(1)	9(1)	-12(2)	2301.14	103.32	0.1115
2 N/O	2.24(2)	0(2)				
1 N/O	3(1)	66(433)	7(4)	7275.48	358.91	0.3814
2 N/O	2.24(2)	0(2)				
2 N/O	2.3(3)	28(43)	6(3)	7523.24	371.14	0.3647
3 N/O	2.24(1)	0(1)				
1 N/O	3(3)	103(1254)	6(2)	4550.26	224.47	0.2205
4 N/O	2.23(1)	0(1)				
1 N/O	4.5(1)	0(12)	5(1)	3244.69	160.06	0.1573
3 N/O	2.23(1)	0(1)				
2 N/O	2.1(4)	88(19)	5(3)	4924.76	242.95	0.2387
5 N/O	2.23(1)	1(1)				
1 N/O	3.74(7)	0(7)	4(1)	2898.02	142.96	0.1404
4 N/O	2.23(1)	0.2(6)				

2 N/O	2.60(2)	1(2)	4(2)	2701.15	133.25	0.1309
3 N/O	2.17(5)	4(7)				
3 N/O	2.24(3)	0(2)	1(2)	3346.11	165.07	0.1622
6 N/O	2.23(1)	2(1)				
1 N/O	1.69(7)	21(16)	5(1)	2637.64	130.12	0.1278
4 N/O	2.16(4)	6(5)				
3 N/O	2.24(2)	0(1)	0(2)	3859.21	190.38	0.187
5 N/O	2.23(1)	1(1)				
2 N/O	1.65(7)	48(22)	5(1)	2337.26	115.3	0.1133
2 S	2.36(1)	0(1)				
1 S	2.26(1)	0(1)	-10(1)	589.77	29.09	0.0285
2 S	2.27(1)	3(1)				
2 S	2.36(1)	1(1)	-12(1)	316.52	15.61	0.0153
3 S	2.23(1)	1(1)				
1 S	2.35(1)	2(1)	-12(1)	323.14	15.94	0.0156
4 S	4.3(1)	14(20)				
1 S	2.33(1)	4(1)	-10(1)	428.49	21.13	0.0207
3 S	2.25(2)	9(3)				
2 S	2.34(1)	3(1)	-13(1)	434.91	21.45	0.021
5 S	No fit					
1 S						
4 S	2.7(2)	52(42)				
2 S	2.33(1)	4(1)	-10(1)	428.94	21.16	0.0207
3 S	2.26(3)	16(4)				
3 S	2.33(5)	3(1)	-14(2)	583.07	28.76	0.0282
6 S	2.33(1)	7(1)				
1 S	1.81(6)	56(13)	-10(1)	1007.27	49.69	0.0488

4 S	2.33(1)	4(1)				
3 S	2.7(2)	63(41)	-10(1)	424.35	20.93	0.0305
5 S	2.33(1)	6(1)				
2 S	2.0(1)	52(21)	-10(1)	622.06	30.68	0.0301
2 N/O	2.17(4)	2(2)				
1 S	2.35(2)	0(1)	-5(4)	2283.94	112.67	0.1167
1 N/O	2.12(2)	0(2)				
2 S	2.34(1)	1(1)	-8(2)	761.83	37.58	0.0369
2 N/O	2.15(1)	1(1)				
2 S	2.359(5)	1.1(3)	-5(1)	334.81	16.51	0.0162
3 N/O	2.20(1)	1(1)				
1 S	2.39(1)	0(1)	1(1)	730.27	36.02	0.0354
1 N/O	2.11(2)	1(1)				
3 S	2.342(4)	2.8(3)	-9(1)	332.07	16.38	0.016
1 N/O	1.4(1)	37(25)				
4 S	2.333(4)	4.5(2)	-10(1)	393.93	19.43	0.019
4 N/O	2.24(1)	1(1)				
1 S	1.93(4)	14(5)	6(1)	2715.76	133.97	0.1316
2 N/O	2.17(3)	8(3)				
3 S	2.343(5)	3.4(3)	-7(1)	345.85	17.06	0.0167
3 N/O	2.17(1)	4(1)				
2 S	2.36(1)	1.9(4)	-4(1)	358.04	17.66	0.0173
5 N/O	2.19(1)	5(1)				
1 S	2.37(1)	0(1)	-1(1)	859.65	42.4	0.0416
1 N/O	1.5(2)	48(53)				
5 S	2.33(1)	5.9(3)	-10(1)	704.01	34.73	0.0341
2 N/O	2.28(7)	23(52)				
4 S	2.34(1)	4.5(3)	-9(3)	375.86	18.54	0.0182
4 N/O	2.20(2)	7(2)				

2 S	2.354(5)	2(1)	-3(1)	444.98	21.95	0.0215
3 N/O	2.21(3)	11(5)				
3 S	2.344(4)	3.5(4)	-6(1)	351.61	17.34	0.017
6 N/O	2.21(2)	7(1)				
1 S	2.36(1)	0(1)	-1(2)	1249.03	61.61	0.0605
1 N/O	1.7(2)	36(42)				
6 S	2.33(1)	7.3(5)	-11(1)	1359.73	67.07	0.0659
5 N/O	2.22(2)	10(2)				
2 S	2.351(4)	2(1)	-3(2)	586.42	28.92	0.0284
2 N/O	1.5(1)	62(43)				
5 S	2.33(1)	5.9(3)	-10(1)	689.22	34	0.0334
4 N/O	2.24(3)	13(6)				
3 S	2.345(4)	3.5(4)	-5(2)	369.94	18.25	0.0179
3 N/O	2.29(5)	24(44)				
4 S	2.34(1)	4.5(3)	-8(4)	355.51	17.53	0.0172
2 N/O (2 Im)	2.35(1)	1(1)				
2 S	2.10(2)	2(1)	-6(2)	693.49	48.59	0.0336
2 N/O (1 Im)	2.35(1)	1(1)				
2 S	2.11(2)	2(1)	-5(2)	731.53	51.26	0.0354
1 N/O	2.1(2)	5(26)				
1 N/O (1 Im)	2.1(1)	0(5)				
2 S	2.34(1)	1(1)	-8(3)	484.74	39.5	0.0235
1 N/O (1 Im)	**2.08(2)**	**3(2)**				
3 S	**2.34(4)**	**3(3)**	**-9(1)**	**186.44**	**13.07**	**0.009**
2 N/O (2 Im)	2.08(2)	9(2)				
3 S	2.34(1)	3(2)	-8(1)	305.28	21.39	0.0148
2 N/O (1 Im)	2.08(2)	8(2)				

3 S	2.34(4)	3(2)	-8(1)	274.14	19.21	0.0132
1 N/O	2.2(2)	8(17)				
1 N/O	2.1(1)	7(7)				
(1 Im)						
3 S	2.34(1)	3(1)	-8(2)	237.31	19.34	0.0115
3 N/O	2.11(2)	5(1)				
(3 Im)						
2 S	2.35(1)	1(1)	-5(2)	618.1	43.31	0.0299
3 N/O	2.11(2)	5(1)				
(2 Im)						
2 S	2.35(1)	1(1)	-5(2)	641.71	44.96	0.0311
3 N/O	2.12(2)	5(1)				
1 Im						
2 S	2.35(1)	1(1)	-4(2)	656.47	46	0.0318
2 N/O	2.09(3)	8(5)				
1 N/O	2.16(4)	0(2)				
(2 Im)						
2 S	2.36(1)	1(1)	-5(2)	254.25	20.71	0.0123
1 N/O	2.06(5)	10(9)				
2 N/O	2.16(2)	1(1)				
(1 Im)						
2 S	2.36(1)	2(1)	-5(1)	309.56	25.21	0.0149
3 N/O	2.09(3)	12(3)				
(3 Im)						
3 S	2.34(1)	3(1)	-8(2)	330.47	23.15	0.016
3 N/O	2.10(2)	12(3)				
(2 Im)						
3 S	2.34(1)	3(1)	-7(1)	287.47	20.14	0.0139
3 N/O	2.09(2)	12(2)				
(1 Im)						
3 S	2.34(1)	3(1)	-8(1)	265.62	18.61	0.0128
2 N/O	2.09(5)	12(8)				
1 N/O	2.22(9)	6(21)				
(2 Im)						
3 S	2.34(1)	3(1)	-7(2)	263.16	21.44	0.0127

1 N/O	2.1(1)	9(9)				
2 N/O	2.22(8)	10(17)				
(1 Im)						
3 S	2.34(1)	3(1)	-6(2)	215.36	17.55	0.0104
4 N/O	2.10(3)	15(3)				
(4 Im)						
3 S	2.34(1)	3(1)	-7(2)	333.64	23.38	0.0161
4 N/O	2.10(3)	15(3)				
(3 Im)						
3 S	2.34(1)	3(1)	-7(2)	324.93	22.76	0.0157
4 N/O	2.10(2)	16(3)				
(2 Im)						
3 S	2.34(1)	3(1)	-8(1)	279.8	19.6	0.0135
4 N/O	2.10(2)	15(3)				
(1 Im)						
3 S	2.34(1)	3(1)	-7(1)	264.55	18.53	0.0128
3N	2.26(5)	5(26)				
1 N/O	2.09(4)	6(9)				
(1 Im)						
3 S	2.34(4)	4(5)	-4(3)	206.2	16.8	0.0099
2 N/O	2.25(4)	8(19)				
2 N/O	2.09(5)	12(8)				
(2 Im)						
3 S	2.34(1)	3(1)	-6(2)	240.1	19.56	0.0116
1 N/O	2.12(4)	2(2)				
3 N/O	2.1(2)	34(27)				
(3 Im)						
3 S	2.34(1)	3(1)	-8(3)	260.56	21.23	0.0126
4 S	2.34(1)	4(1)				
1 N/O	2.05(9)	13(1)	-10(2)	325.21	22.78	0.0157
(1 Im)						
4 S	2.34(1)	5(1)				
2 N/O	2.10(7)	23(13)	-10(1)	326.56	22.88	0.0158
(2 Im)						
4 S	2.34(1)	5(1)				
3 N/O	2.13(5)	26(12)	-9(1)	298.84	20.94	0.0144

(3 Im)						
4 S	2.33(2)	4(2)				
1 N/O	2.31(9)	0(6)				
1 N/O	2.09(8)	10(11)	-8(2)	218.96	21.31	0.0106
(1 Im)						
4 S	2.34(1)	5(1)				
2 N/O	2.19(7)	24(23)	-9(1)	251.08	17.59	0.0121
(1 Im)						
4 S	2.34(1)	5(1)				
2 N/O	2.26(6)	18(55)				
1 N/O	2.00(7)	12(12)	-9(4)	270.33	22.03	0.0131
(1 Im)						
4 S	2.33(1)	5(1)				
1 N/O	2.50(2)	0(2)				
2 N/O	2.08(6)	22(12)	-12(1)	191.98	15.64	0.0093
(2 Im)						
4 S	2.34(1)	5(1)				
3 N/O	2.12(7)	31(16)	-10(1)	284.2	19.91	0.0137
(1 Im)						
4 S	2.34(1)	5(1)				
3 N/O	2.22(5)	18(13)	-7(2)	284.73	19.95	0.0138
(2 Im)						
1 S	2.34(5)	3(3)				
2 S	2.34(5)	3(5)	-9(2)	314.38	25.62	0.0152
1 N/O	2.07(3)	3(3)				
(1 Im)						