Electronic Supplementary Material (ESI) for Journal of Materials Chemistry

Supplementary Materials

High surface area ordered mesoporous nano-titania by rapid surfactant-free approach

By Gulaim A. Seisenbaeva, Geoffrey Daniel, Jean-Marie Nedelec, Yurii K. Gun'ko, and Vadim G. Kessler

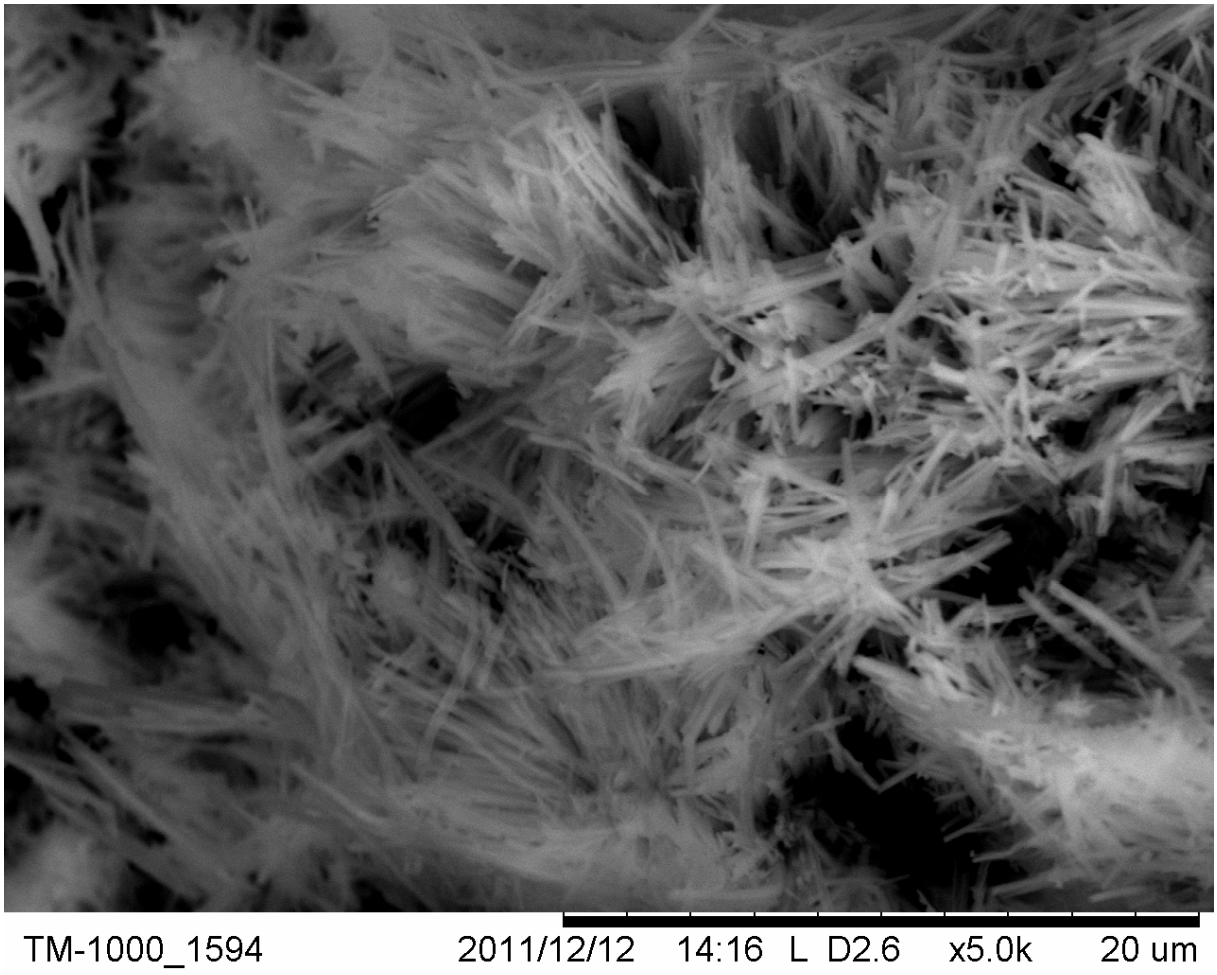


Figure FS1 Typical appearance of TiO_2 nanorods obtained from $Ti(OMe)_4$ nanorods after 30 min of reflux in water (SEM).

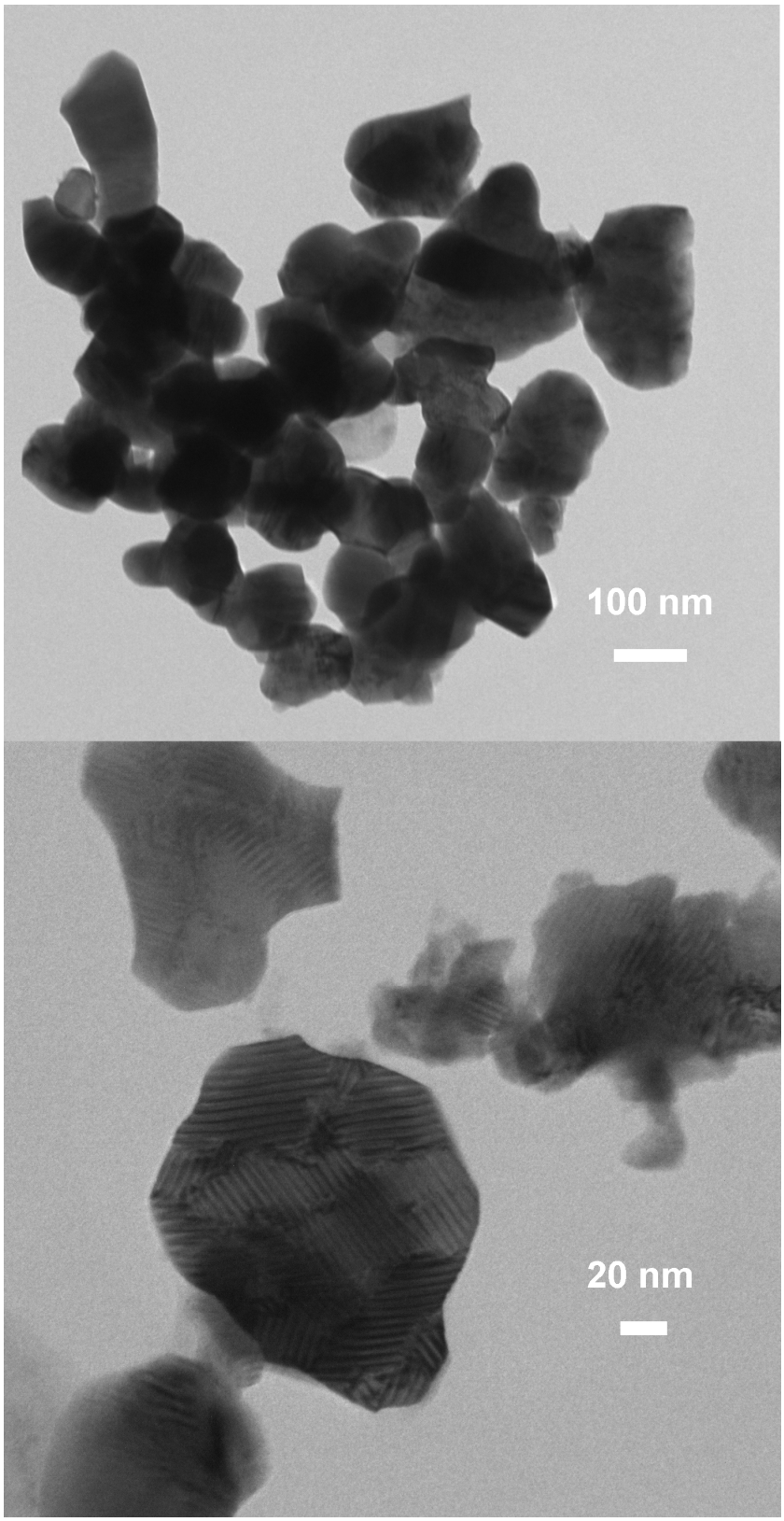


Figure FS2 TEM image of the material produced by immersion of $[Ti(O^{i}Pr)_3(Pca)]_2$ nanocrystals into boiling water.

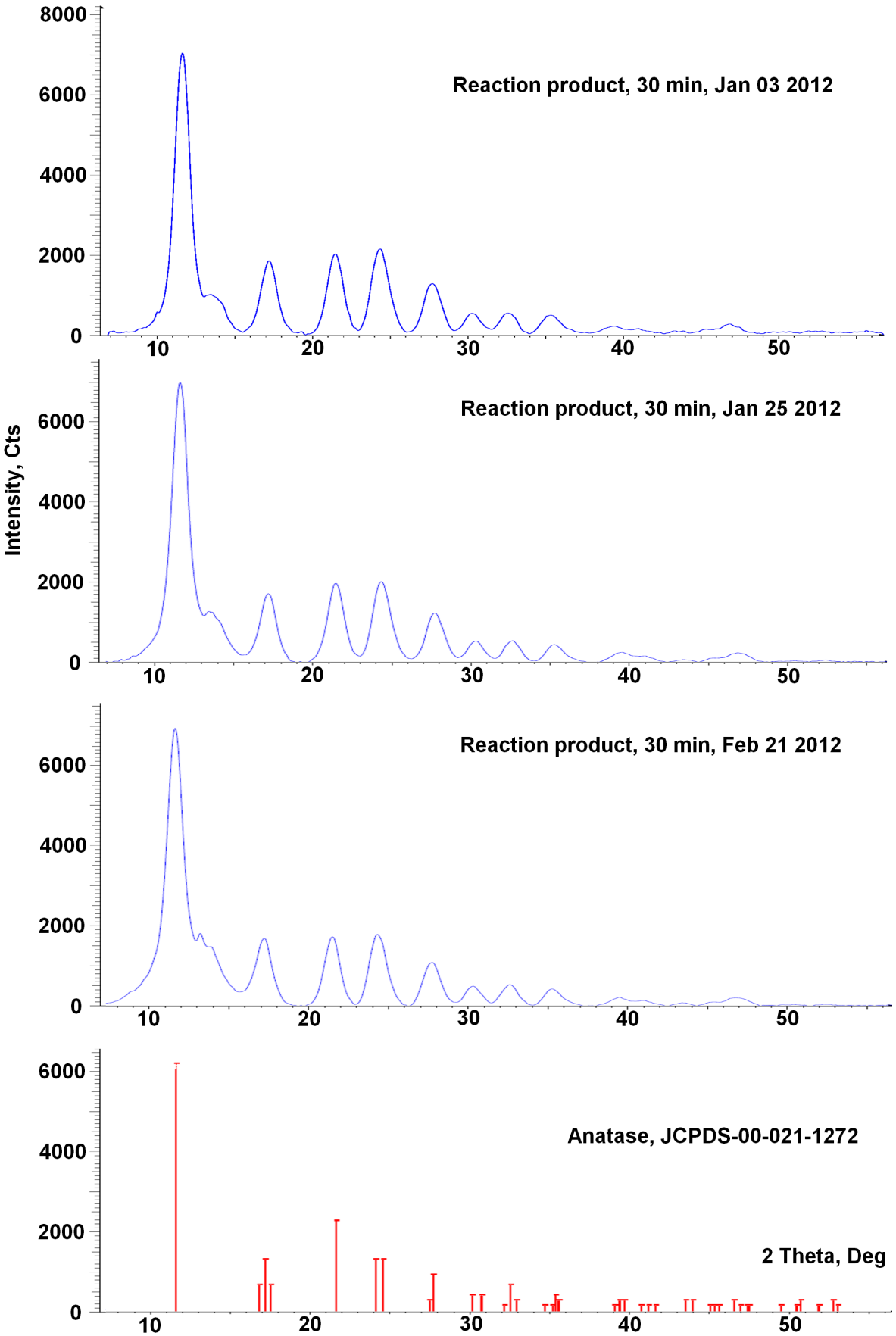


Figure FS3 XPD of the fully crystalline products after 30 min of synthesis and the reference data for anatase

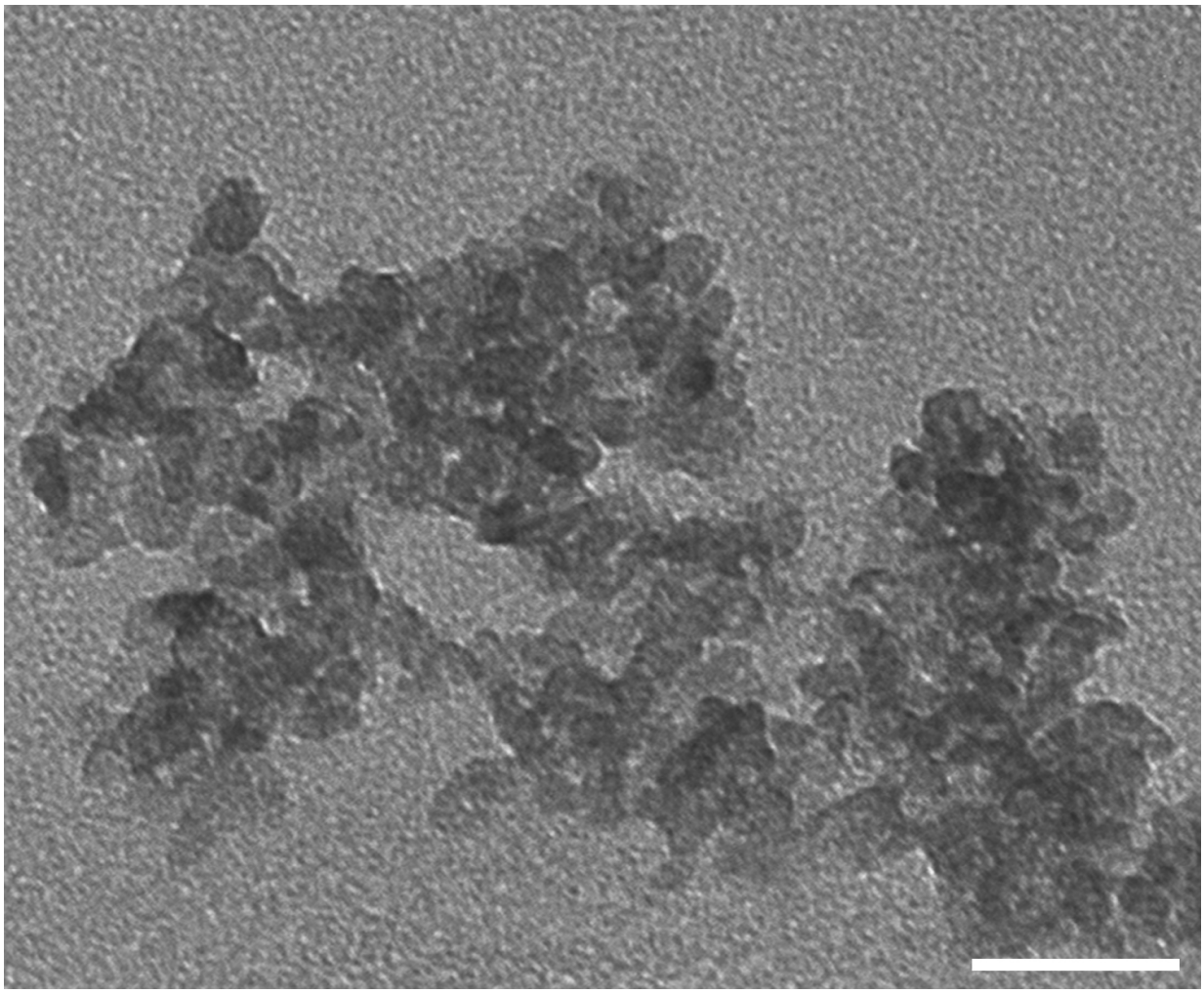


Figure FS4 Enlarged image in Fig.4a, the scale bas size is 25 nm

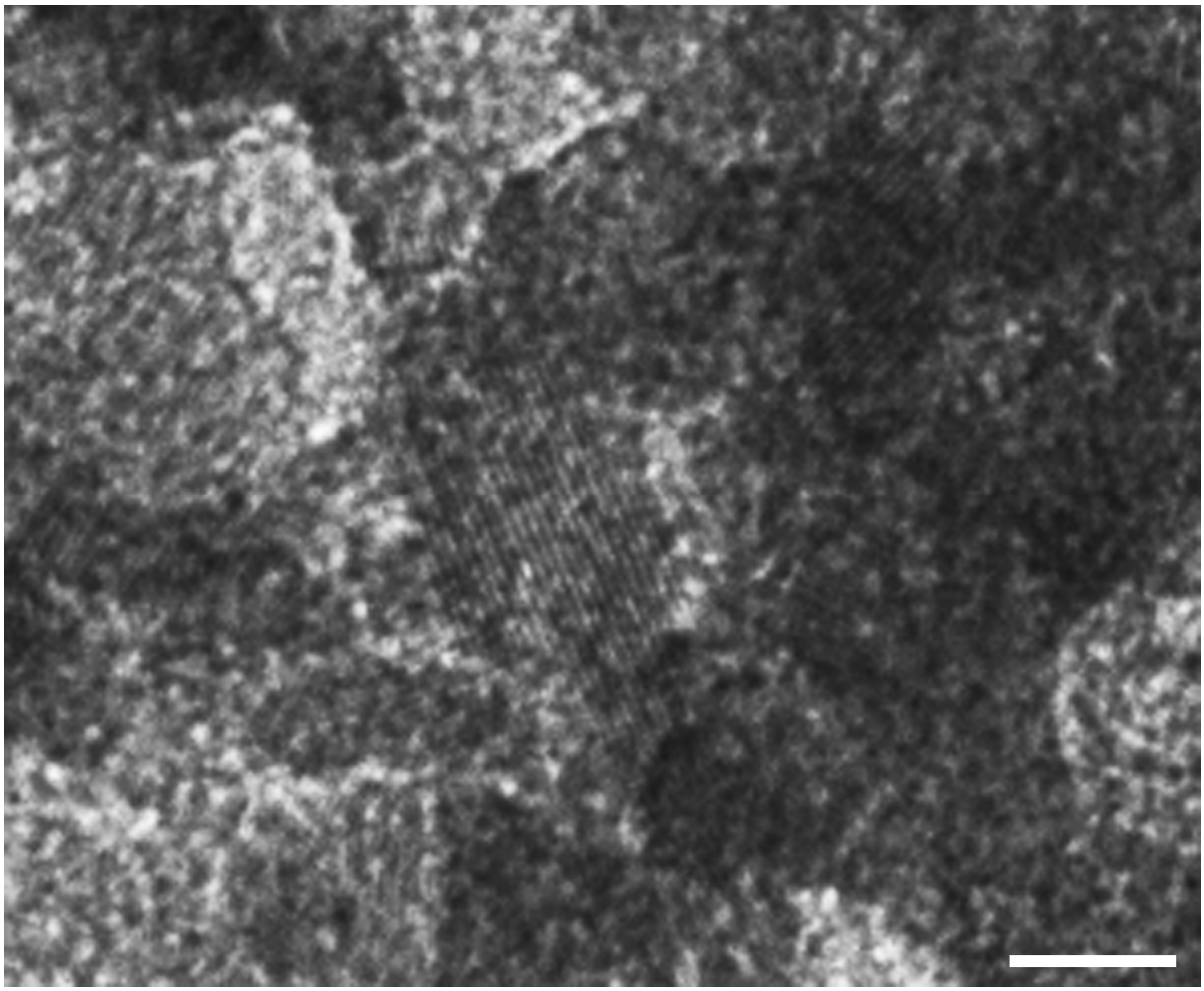


Figure FS5 Broader view image corresponding to the part shown in Fig4b, the scale bar size is 5 nm

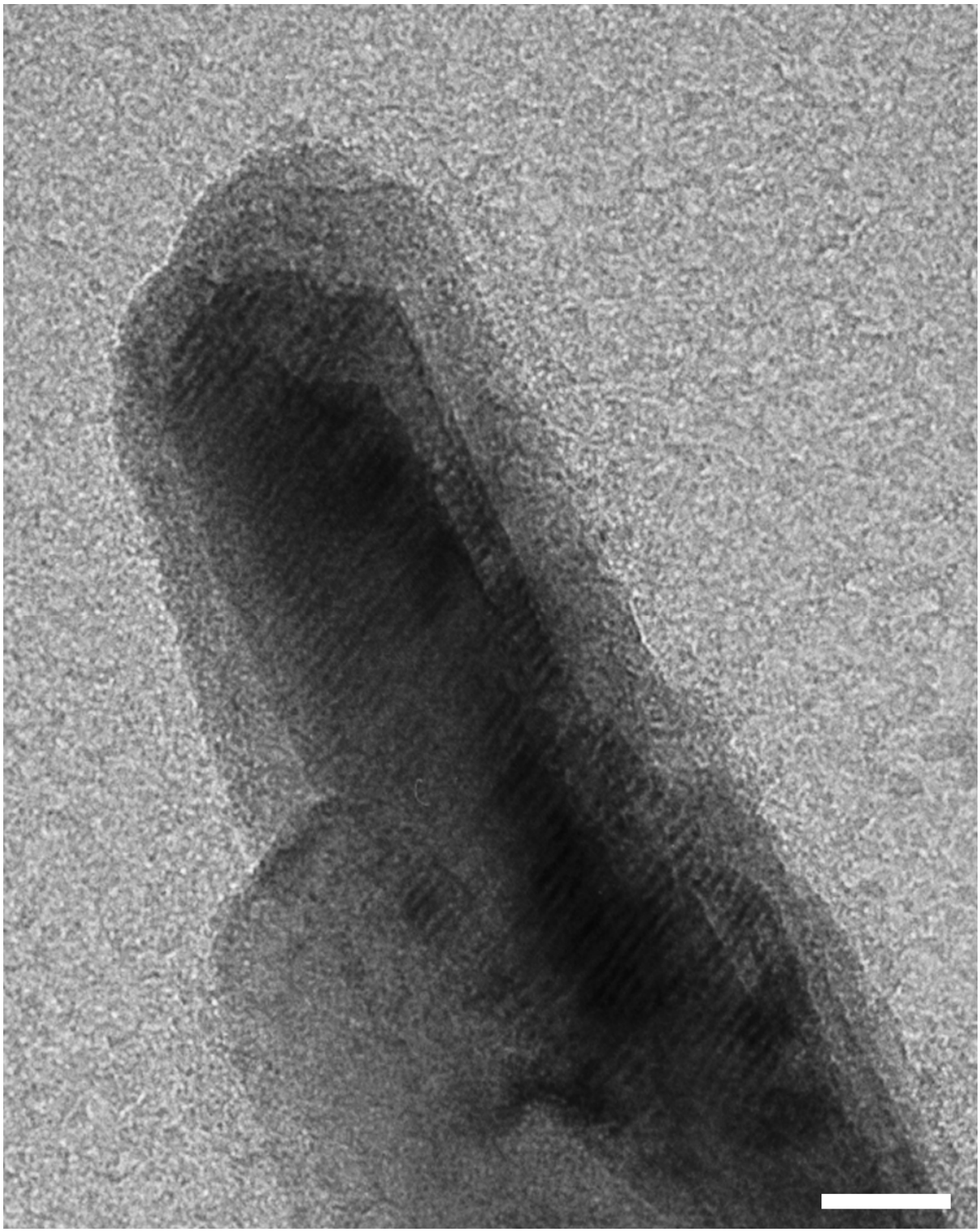


Figure FS6 Enlarged image from Fig.2b, the scale bar size is 20 nm

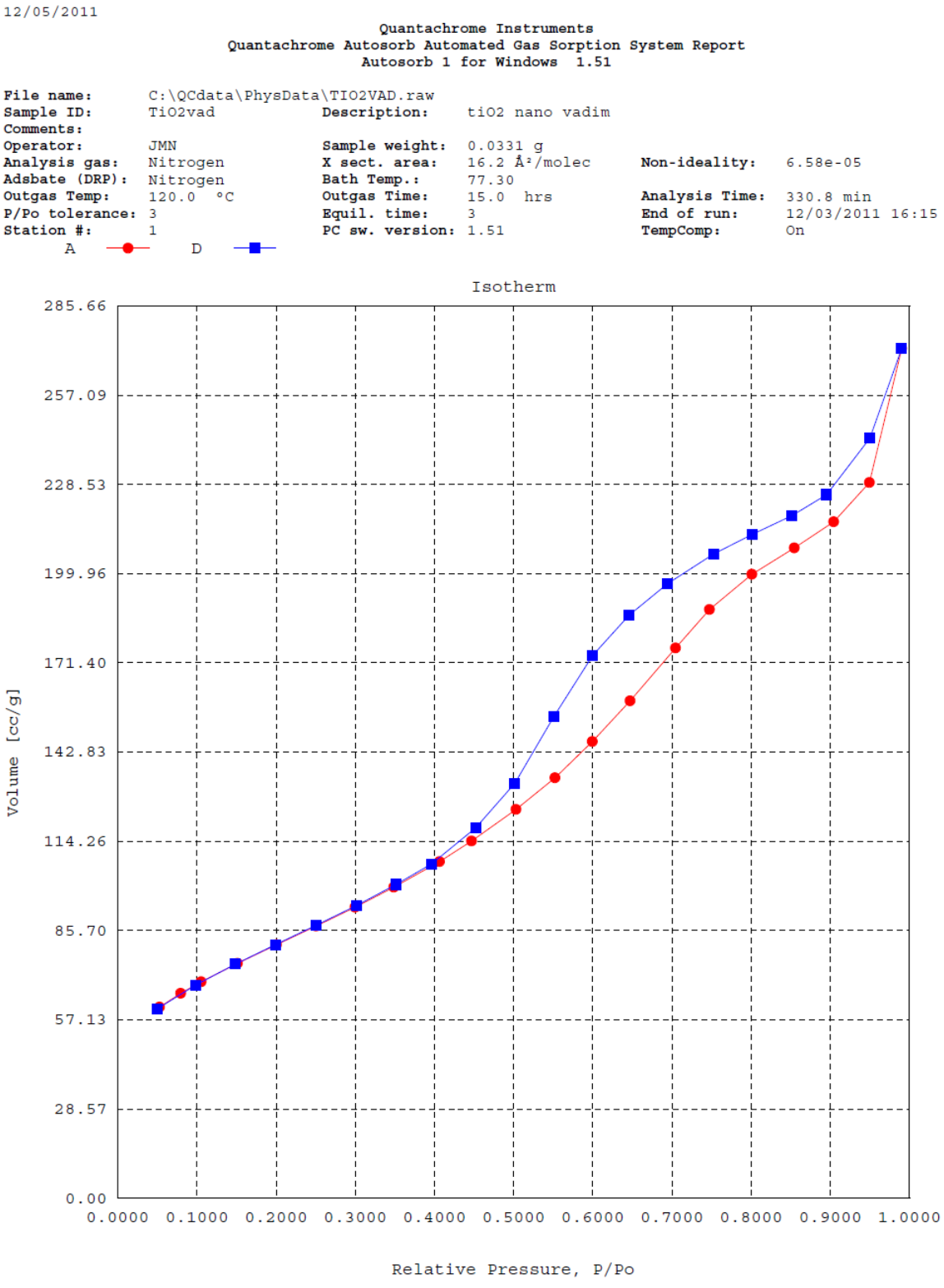


Figure FS7a Nitrogen adsorption isotherm, experimental details

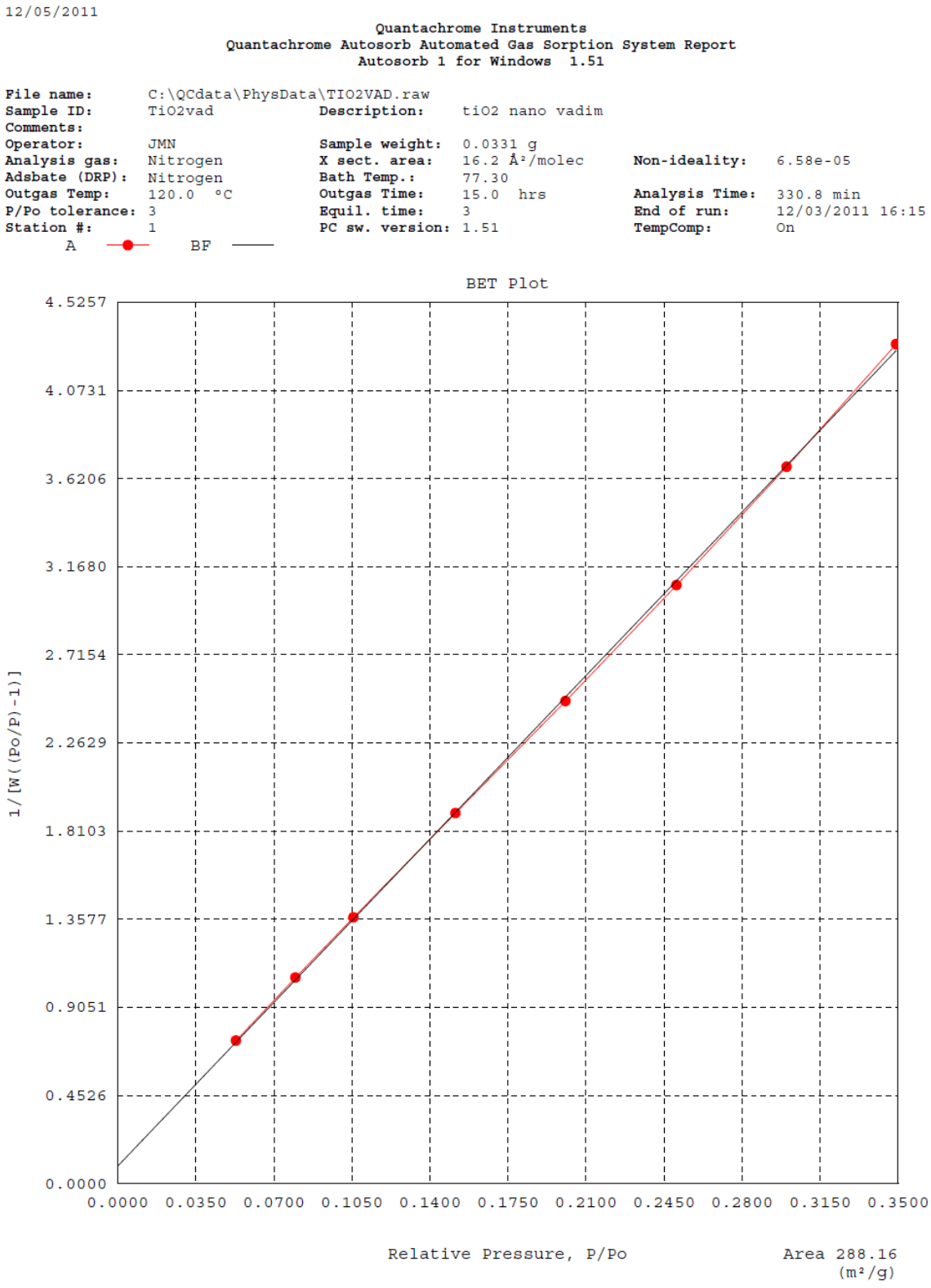


Figure FS7b BET specific surface area determination, experimental details

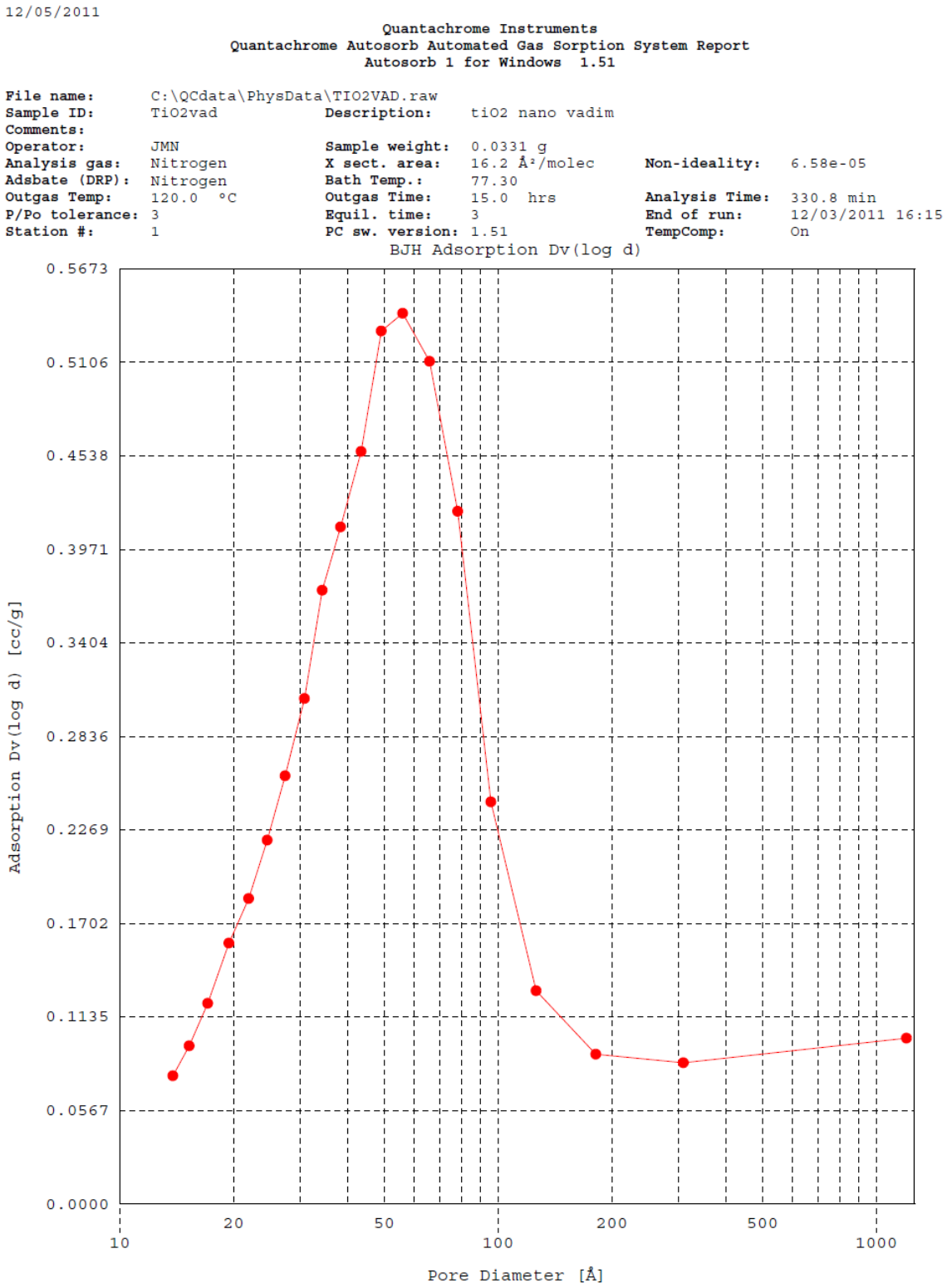


Figure FS7c BJH active pore volume determination using adsorption isotherm, experimental details

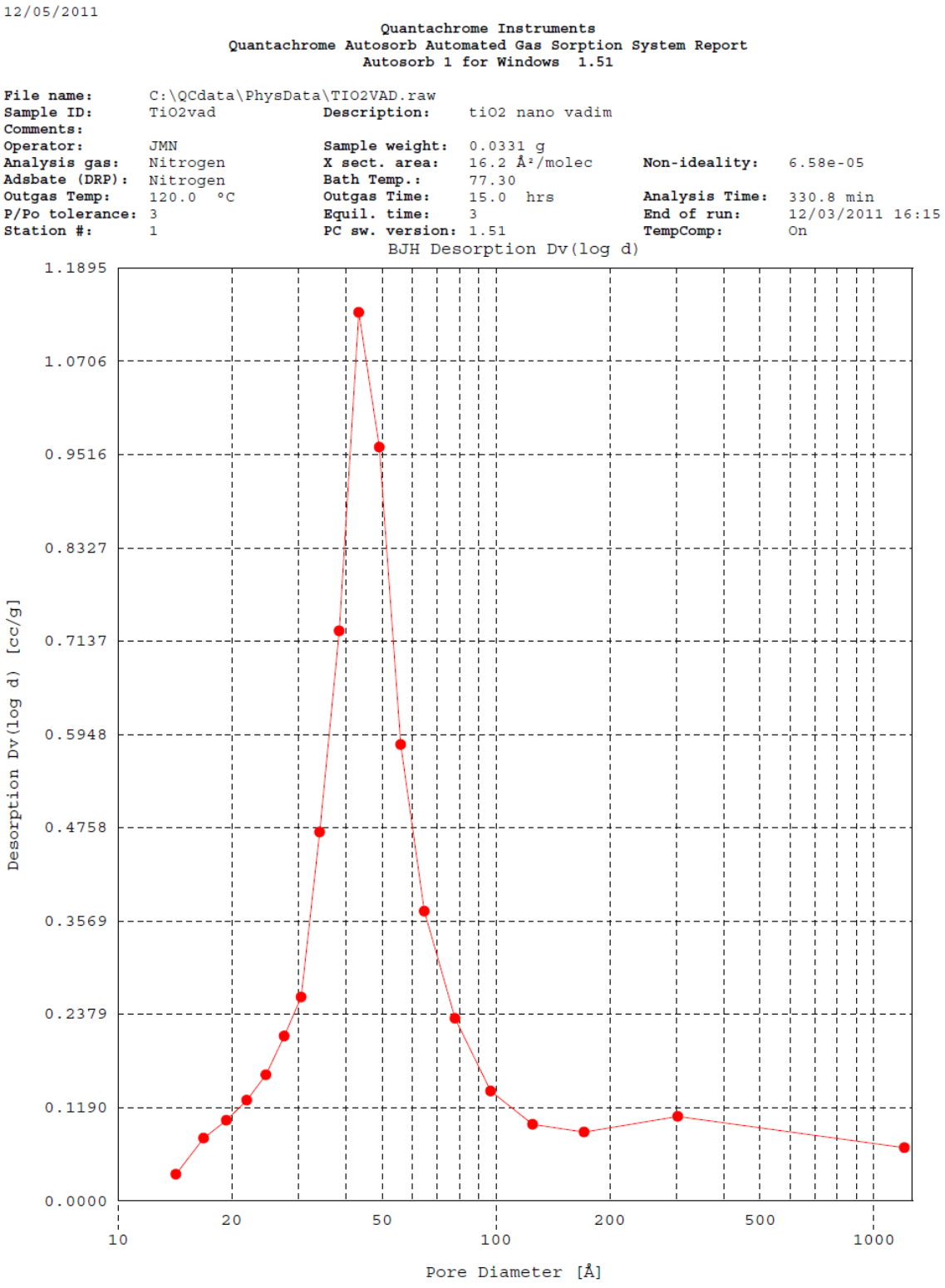


Figure FS7d BJH active pore volume determination using desorption isotherm, experimental details

Table TS1

AREA-VOLUME-PORE SIZE SUMMARY

SURFACE AREA DATA

Multipoint BET	3.460E+02	m^2/g
BJH Method Cumulative Adsorption Surface Area	3.611E+02	m^2/g
BJH Method Cumulative Desorption Surface Area	3.821E+02	m^2/g
DH Method Cumulative Adsorption Surface Area	3.698E+02	m^2/g
DH Method Cumulative Desorption Surface Area	3.928E+02	m^2/g

PORE VOLUME DATA

Total Pore Volume for pores with Diameter less than 1955.2 Å at P/Po = 0.99007	3.487E-01	cc/g
BJH Method Cumulative Adsorption Pore Volume	3.439E-01	cc/g
BJH Method Cumulative Desorption Pore Volume	3.507E-01	cc/g
BJH Interpolated Cumulative Adsorption Pore Volume for pores in the range of 5000.0 to 0.0 Å Diameter	3.439E-01	cc/g
BJH Interpolated Cumulative Desorption Pore Volume for pores in the range of 5000.0 to 0.0 Å Diameter	3.507E-01	cc/g
DH Method Cumulative Adsorption Pore Volume	3.365E-01	cc/g
DH Method Cumulative Desorption Pore Volume	3.439E-01	cc/g

PORE SIZE DATA

Average Pore Diameter	4.031E+01	Å
BJH Method Adsorption Pore Diameter (Mode)	2.771E+01	Å
BJH Method Desorption Pore Diameter (Mode)	3.406E+01	Å
DH Method Adsorption Pore Diameter (Mode)	2.771E+01	Å
DH Method Desorption Pore Diameter (Mode)	3.406E+01	Å

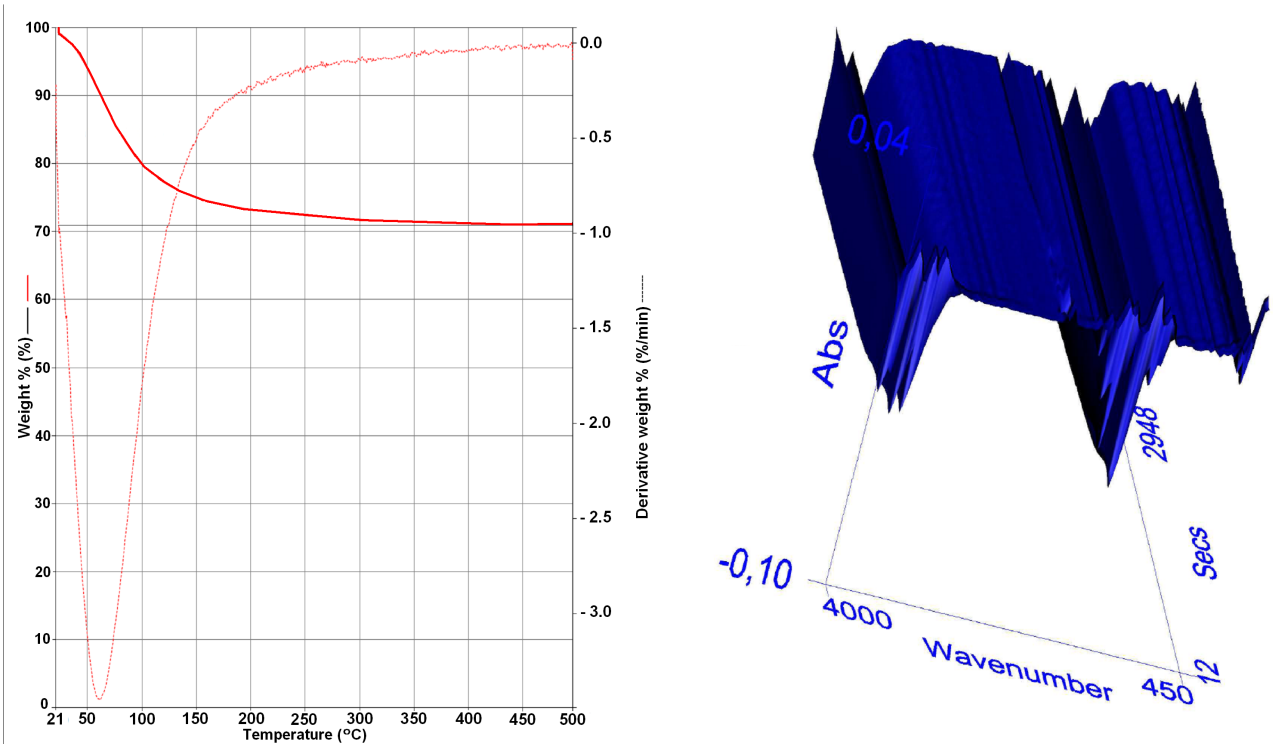
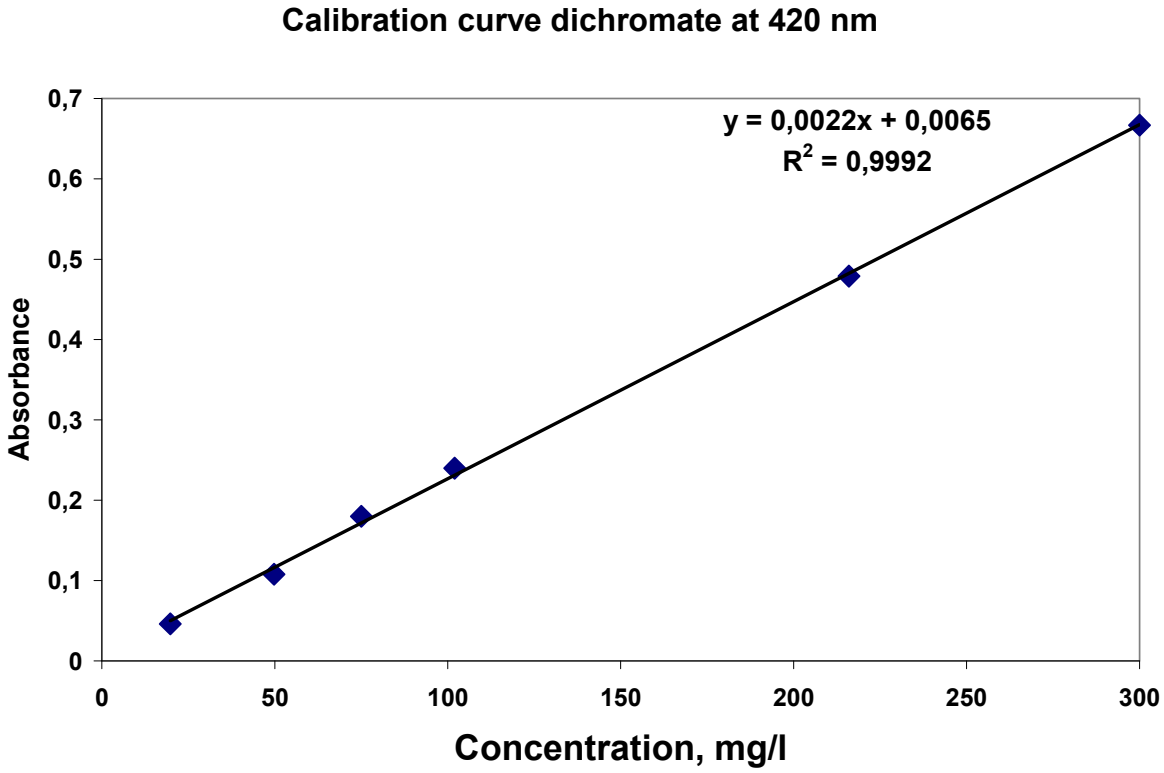


Figure FS8 TG curve for thermal treatment in air of the material resulting from 30 min of reflux (a) and the time-resolved FTIR spectra of the outgoing gases (b).



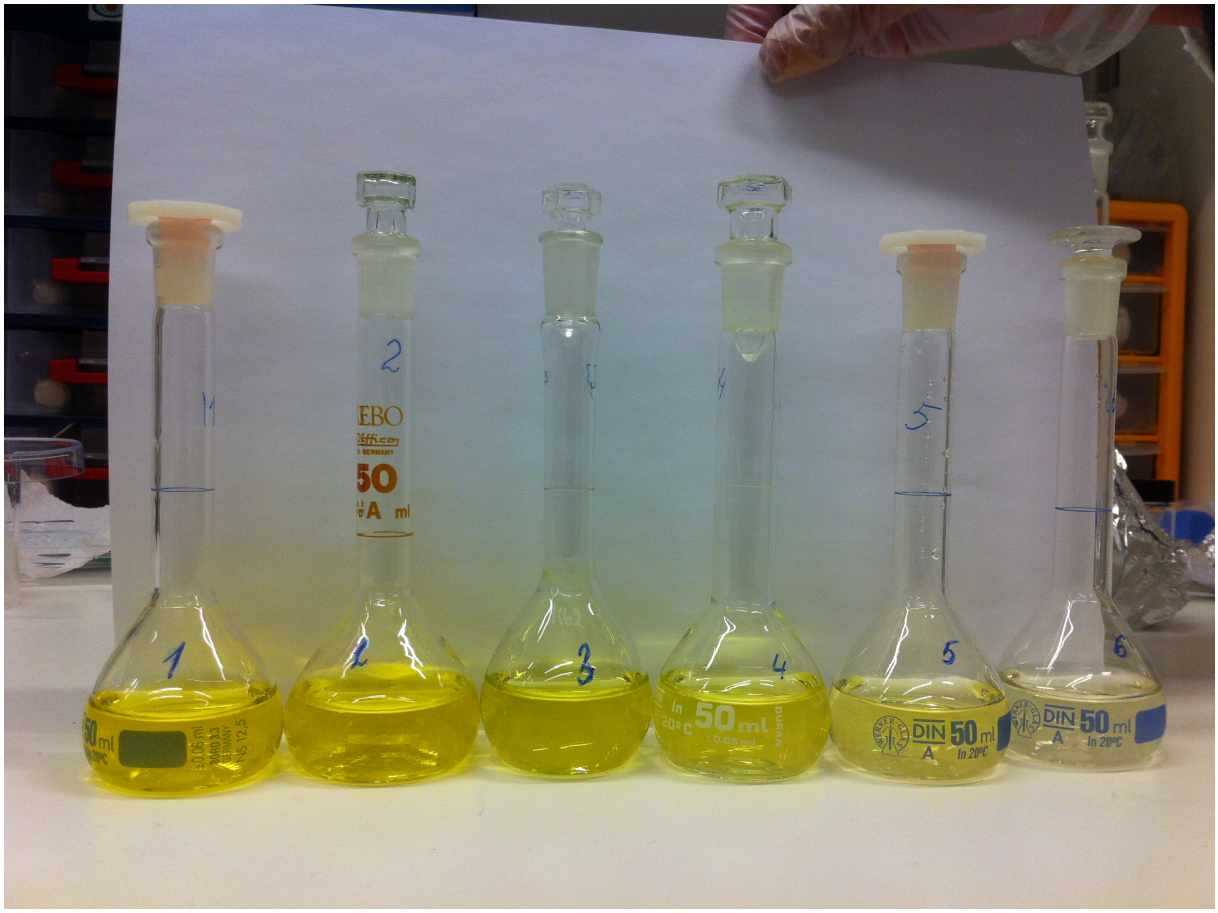


Figure FS9 Calibration curve and reference solutions for spectrophotometric determination of dichromate ion, $Cr_2O_7^{2-}$, adsorption capacity.

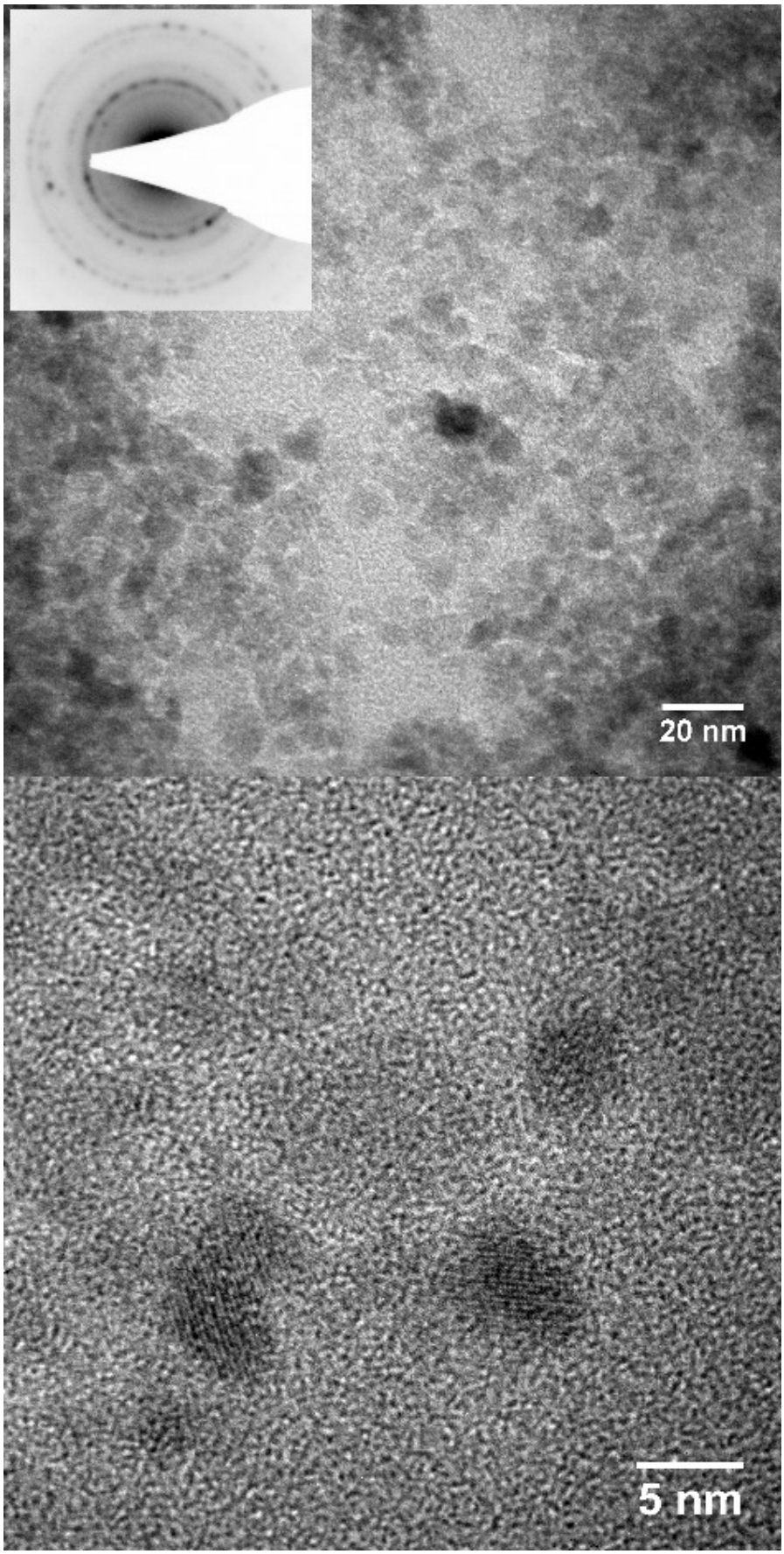


Figure FS10 TEM images of Fe_3O_4 nanoparticles. The inset in the image above shows Selected Area Electron Diffraction pattern typical for magnetite.

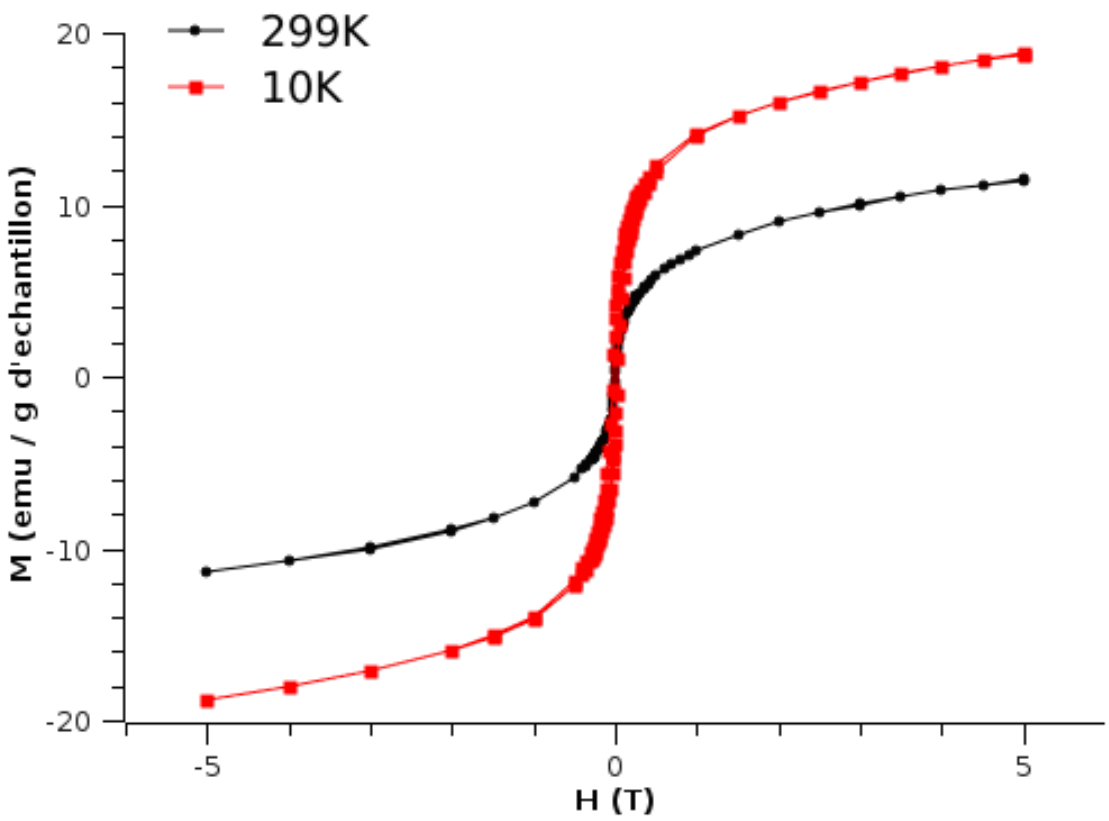


Figure FS11 Magnetic characterization of the produced Fe_3O_4 nanoparticles

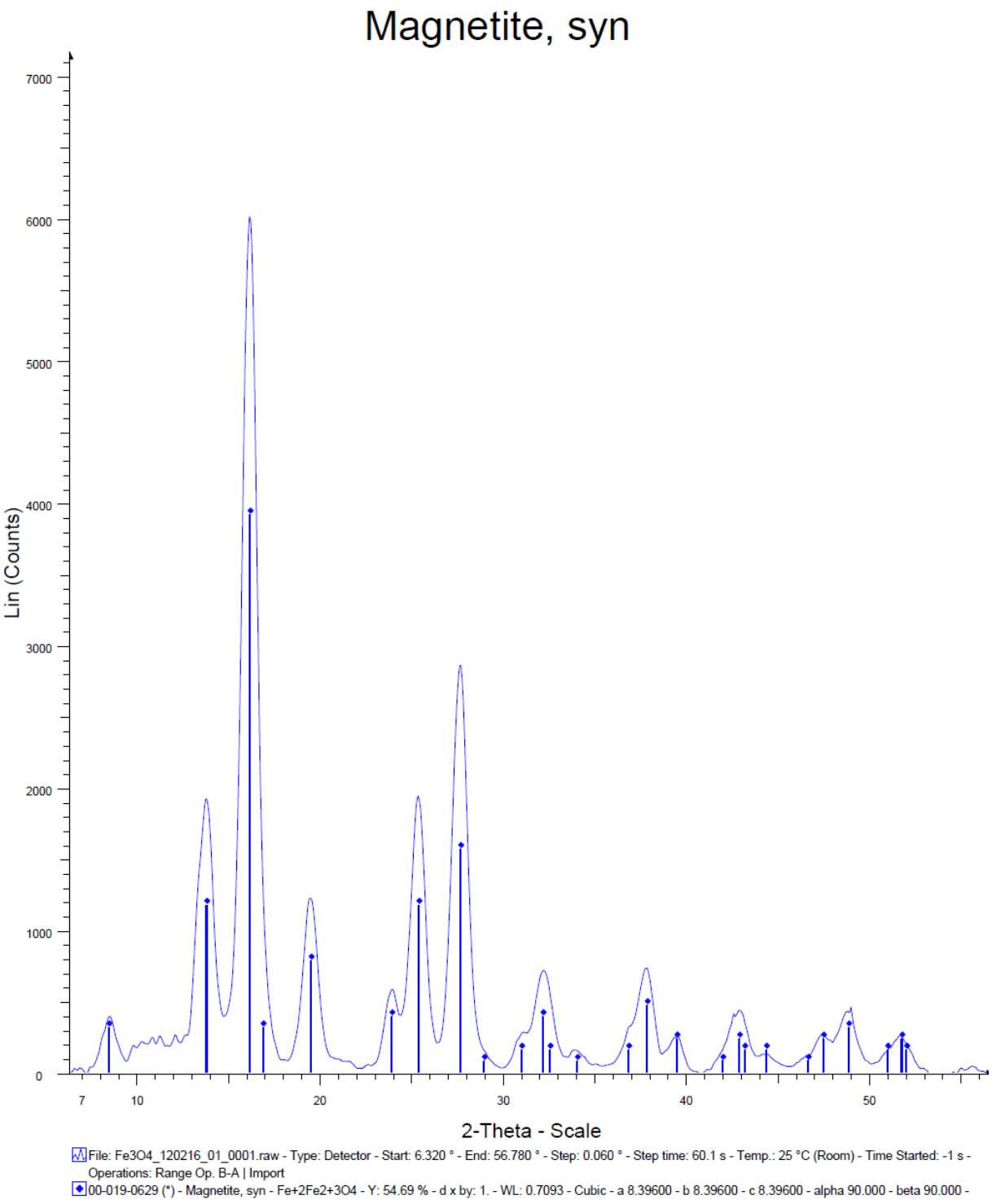


Figure FS12 X-ray powder diffraction pattern of the applied Fe_3O_4 nanoparticles.