

Supplementary materials
for
Organic Matter and Mineral Composition of Silicate Soils: FTIR Comparison
Study by Photoacoustic, Diffuse Reflectance, and Attenuated Total Reflection
Modalities

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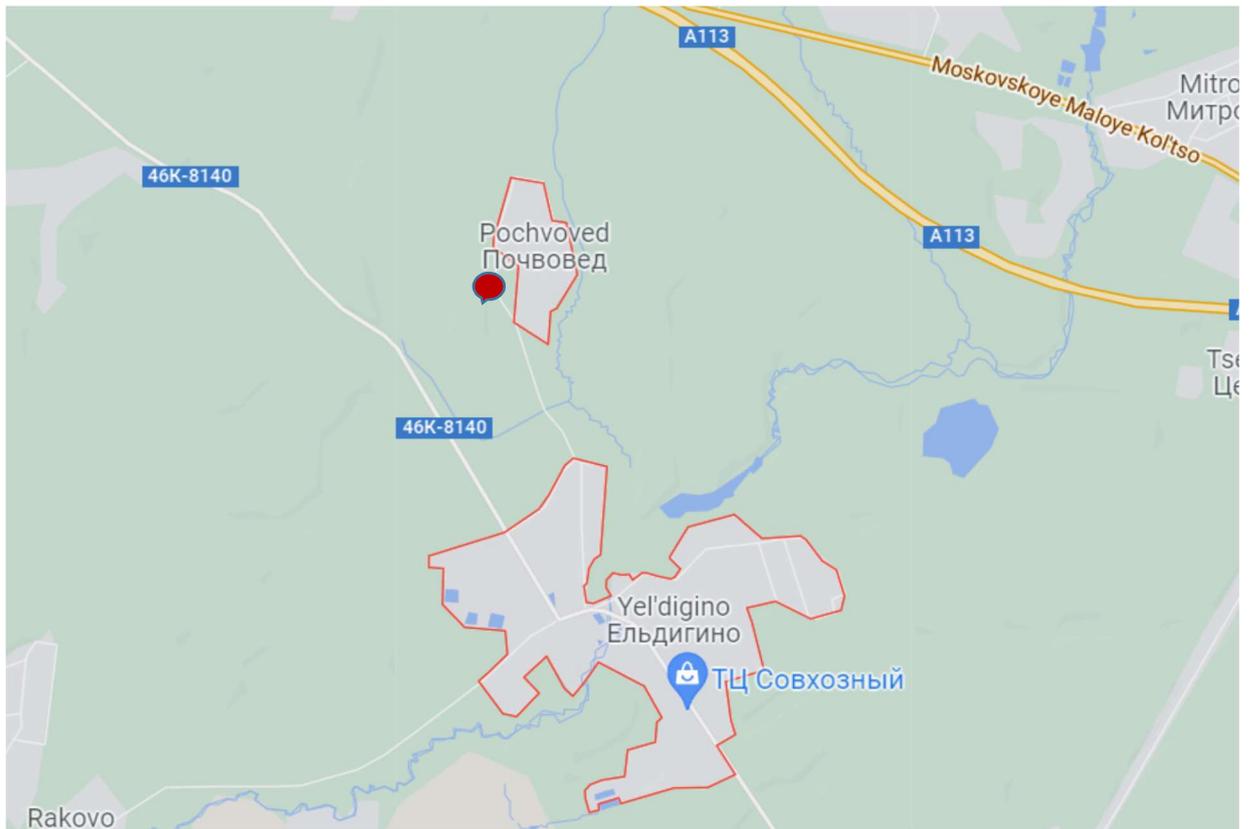


Figure S1. Location of sampling points, a map and satellite pictures. Experimental field of the Zelenograd station of the V.V. Dokuchaev Soil Institute (village of Eldigino, Moscow region, Russia) Red markers on both images are agrosod-podzolic soil. the coordinates of the sampling site are $56^{\circ} 07' 56''$ N $37^{\circ} 48' 09''$ E

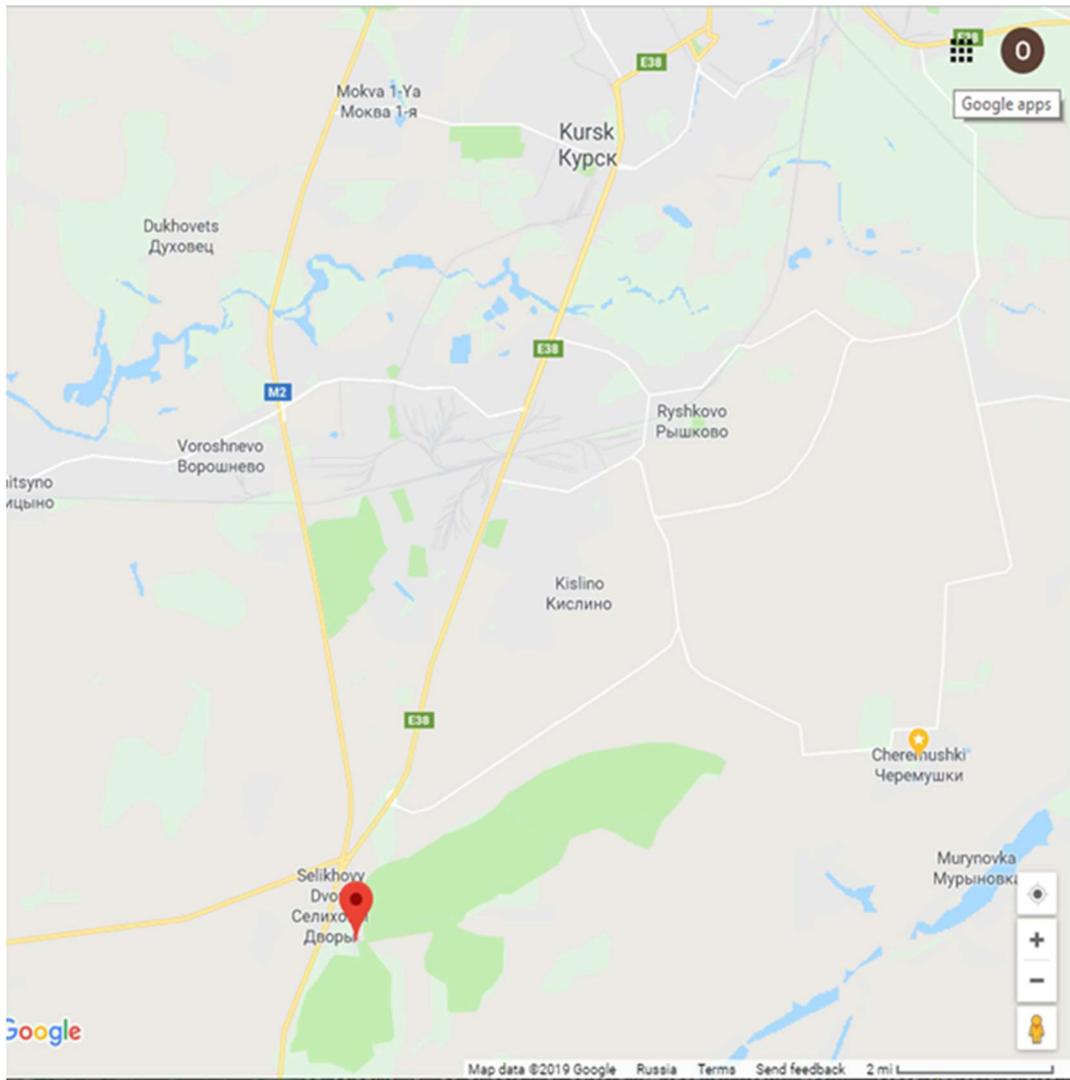


Figure S2. Location of sampling points. A, the positions of natural steppe (red marker, V.V. Alekhin Tsentralno-Chernozemny Nature Reserve) and agrogenic soils (yellow-star marker, Kursk Research Institute of Agricultural Production).



Figure S3. Location of sampling points. Points of selection of agrogenically transformed soils: markers: B, shelterbelt since 1964, E- arable cropland under wheat.

Table S1. Parameters of recording spectra by DRIFT

Spectral range, cm ⁻¹	7500–200
Resolution, cm ⁻¹	2
Background scan	256
Sample scan	256
Phase resolution	16
Phase correction mode	Mertz
Zero filling factor	2
Apodization function	Blackman–Harris 3-Term
Aperture setting	3 mm
Sample and background pre-amplification gain	“Ref” (without amplification) for DLaTGS detector A (standard amplification) for MCT detector
Background signal gain	Auto
Sample signal gain	Auto
Scanner velocity	10 kHz or 20 kHz (with MCT detector)
Detector	Room temperature DLaTGS or liquid nitrogen cooled photovoltaic MCT
Source	MIR
Beam splitter	Wide-range Si
Background	Mirror

Table S2. Parameters of recording spectra by ATR-FTIR

Spectral range, cm ⁻¹	4000–100 (with DLaTGS detector) or 6000–800 (with MCT detector)
Resolution, cm ⁻¹	2
Background scan	128
Sample scan	128
Aperture setting	8 mm
Phase resolution	4
Phase correction mode	Mertz
Zero filling factor	1
Apodization function	Blackman–Harris 3-Term
Sample and background pre-amplification gain	“Ref” (without amplification) for DLaTGS detector B (middle amplification) for MCT detector
Background signal gain	Auto
Sample signal gain	Auto
Scanner velocity	10 kHz (with DLaTGS detector) or 20 kHz (with MCT detector)
Detector	Room temperature DLaTGS or liquid nitrogen cooled photovoltaic MCT
Source	MIR
Beam splitter	Si (with DLaTGS detector) or KBr (with MCT detector)
Background	Diamond crystal with a lowered pressure screw with a flat end

Table S3. Parameters of recording spectra by FTIR-PAS

Spectral range, cm ⁻¹	6000–400
Resolution, cm ⁻¹	4
interferometer modulation frequencies (IMF)	1.6 and 2.5 kHz
Background scan	64 (1.6 kHz); 128 (2.5 kHz)
Sample scan	64 (1.6 kHz); 256 (2.5 kHz)
Phase resolution	10
Phase correction mode	Mertz
Zero filling factor	2
Apodization function	Blackman–Harris 3-Term
Aperture setting	8 mm
Sample and background pre-amplification gain	B (middle amplification)
Sample signal gain	Auto
Detector	microphone
Source	MIR
Beam splitter	KBr

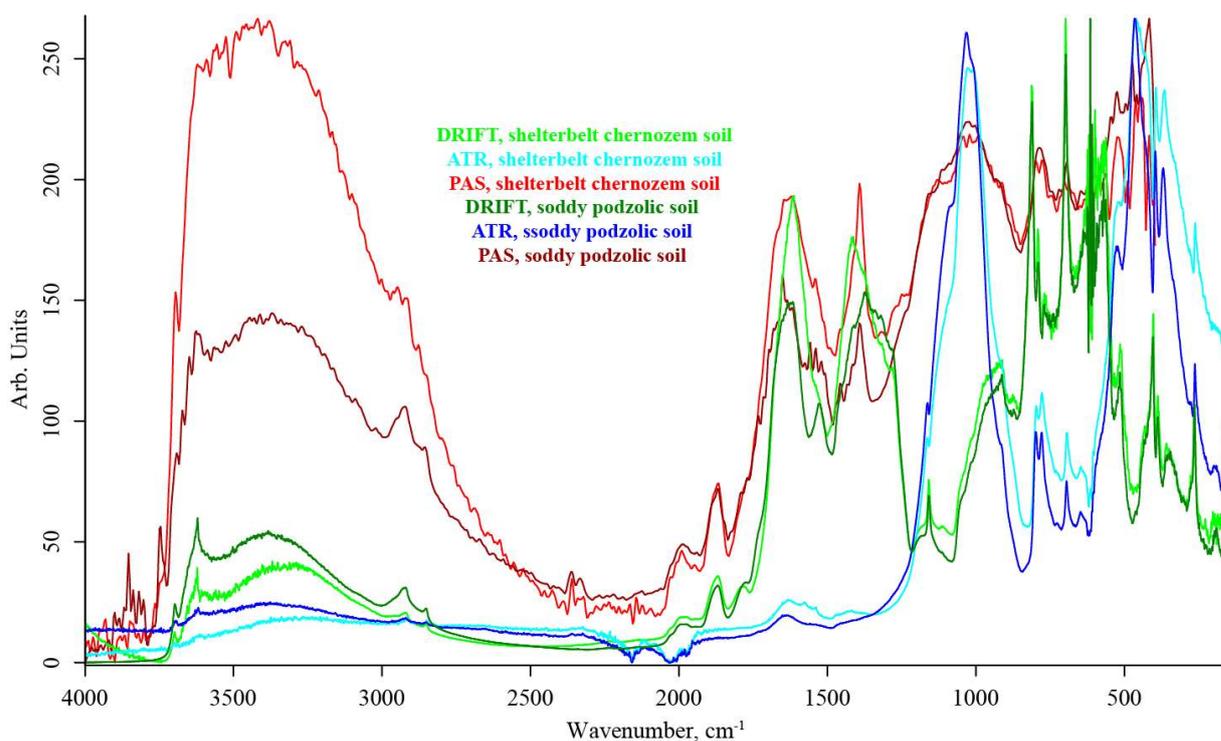


Figure S4. Normalized FTIR spectra in the range 4000–1500 cm^{-1} . DRIFT, ATR, and PAS (IMF, 1.6 kHz) spectra of shelterbelt chernozem soil (dry fractionation, 80–100 μm), light green, light blue, and light red, respectively; and DRIFT, ATR, and PAS (IMF, 1.6 kHz) spectra of soddy podzolic soil (dry fractionation, 80–90 μm), dark green, dark blue, and dark red, respectively.