Datashare 59:

Neoformed magnetic minerals as an indicator of moderate burial: The key example of middle Paleozoic sedimentary rocks, West Virginia

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Table S1. Coordinates of the Studied Samples from West Virginia

Unit	Age	Sample	Latitude	Longitude
Chemung	Devonian	WV37	N 39°11′54.8	W 79°11′11.1
		WV38	N 39°11′56.0	W 79°11′13.3
		WV47	N 38°51′39.2	W 79°22′04.2
		WV50	N 38°54′58.8	W 79°47′07.1
		WV51	N 38°54′58.8	W 79°47′07.1
		WV54	N 39°05′42.0	W 79°45′19.7
		WV55	N 39°05′17.6	W 79°41′16.8
		WV56	N 39°20′04.1	W 79°05′26.6
Brallier	Devonian	WV26	N 39°18′07.3	W 78°52′29.6
		WV42	N 38°59′35.4	W 79°02′44.5
		WV52	N 38°57′16.8	W 79°51′18.5
		WV53	N 39°04′09.8	W 79°48′37.0
Harrell-Brallier	Devonian	WV10	N 39°11′51.53	W 79°2′46.34
		WV11	N 39°11′51.53	W 79°2′46.34
		WV24	N 39°20′45.2	W 78°59′17.8
		WV45	N 38°57′24.4	W 79°17′38.9
Mahantango	Devonian	WV12	N 39°10′21.37	W 79°03′
		WV15	N 39°04′29.11	W 79°02′9.88
		WV21	N 39°06′41.57	W 79°05′
		WV27	N 39°13′48.5	W 78°55′02.4
		WV28	N 39°05 44.6	W 79°06′18.0
		WV29	N 39°03′18.5	W 79°06′49.2
		WV30	N 39°06′48.0	W 79°09′53.6
		WV40	N 39°21′09.4	W 78°59′13.7
		WV41	N 39°21′38.0	W 78°58′53.8
Marcellus-Needmore	Devonian	WV2	N 39°09′40.15	W 78°58′
		WV13	N 39°08′34.64	W 79°04′
		WV14	N 39°08′21.45	W 79°04′5.31
		WV22	N 39°08′25.85	W 78°58′
		WV23	N 39°08′25.85	W 78°58′
		WV25	N 39°19′44.7	W 78°53′12.5
		WV43	N 39°00′13.0	W 79°09′26.8
Needmore/Oriskany	Devonian	WV33	N 39°10′33.9	W 79°07′04.0
Oriskany	Devonian	WV1	N 39°12′4.49	W 79°01′
		WV3	N 39°11′16.39	W 79°00′1.04
Oriskany/Helderberg	Devonian	WV34	N 39°10′37	W 79°07′13.4
		WV35	N 39°10′37	W 79°07′13.4
Helderberg	Devonian	WV9	N 39°12′0.65	W 79°01′
		WV16	N 39°05′11.78	W 79°03′9.08
		WV32	N 39°07′53.6	W 79°12′14.3
		WV36	N 39°11 ′30.2	W 79°09′47.7
Tonoloway	Silurian	WV4	N 39°11′21.74	W 79°00′
		WV5	N 39°11′23.51	W 79°00′
		WV8	N 39°11′57.07	W 79°01′2.48
		WV17	N 39°05′31.30	W 79°03′4.64
		WV18	N 39°05′35.34	W 79°03′
		WV19	N 39°05′35.15	W 79°03′
		WV20	N 39°05′35.15	W 79°04′3.08
		WV39	N 39°26′03.6	W 78°57′16.1
		WV44	N 38°59′10.4	W 79°15′52.2
		WV46	N 38°54′18.0	W 79°18′54.5
McKenzie/Clinton	Silurian	WV6	N 39°11′46.44	W 79°00′
		WV7	N 39°11′39.44	W 79°00′
Clinton	Silurian	WV31	N 39°07′33.3	W 79°10′51.7
		WV39	N 39°26′03.6	W 78°57′16.1
		WV46	N 38°54′18.0	W 79°18′54.5

McKenzie, Needmore and Harrell units are situated at the base of Tonoloway, Marcellus, and Brallier units, respectively. Note that the samples WV39 and WV46 are not well located (Tonoloway or Clinton strata).

Table S2. Magnetic Properties of the Studied Samples from West Virginia

Unit	Age	Sample	Xlf (μSI)	RT-SIRM 300K ($\mu A \cdot m^2/kg$)	A1	A2	A3	Unexploitable
Chemung	Devonian	WV37	354	1600				X
		WV38	314	32	X (a)			
		WV47	363	54				X
		WV50	331	28				X
		WV51	395	42				X
		WV54	316	36				X
		WV55	279	41	X (a)			
		WV56	399	274	X (a)			
Braillier	Devonian	WV26	328	24			X	
		WV42	314	35	X (a)			
		WV52	283	19			X	
		WV53	278	50			X	
Harrell-Braillier	Devonian	WV10	413	45			X	
		WV11	433	29			X	
		WV24	290	27			X	
		WV45	272	32			X	
Mahantango	Devonian	WV12	105	23			X	
		WV15	263	113	X			
		WV21	370	105	X (a)			
		WV27	267	19	X			
		WV28	408	26			X	
		WV29	292	30	X			
		WV30	138	11			X	
		WV40	294	98	X (a)			
		WV41	263	56	X (a)			
Marcellus-Needmore	Devonian	WV2	83	29			X	
		WV13	300	20			X	
		WV14	141	18			X	
		WV22	152	75			X	
		WV23	215	115			X?	
		WV25	315	32	X			
		WV43	335	17			X	
Needmore/Oriskany	Devonian	WV33	201	34	X			
Oriskany	Devonian	WV1	64	50			X	
		WV3	167	76	X			
Oriskany/Helderberg	Devonian	WV34	347	32			X	
		WV35	369	29			X	
Helderberg	Devonian	WV9	145	114	X			
		WV16	229	90	X (a)			
		WV32	23	54			X	
		WV36	103	78			X?	
Tonoloway	Silurian	WV4	551	437	X?			
		WV5	172	43	X (a)			
		WV8	508	217			X?	
		WV17	247	187			X?	
		WV18	219	81	X			
		WV19	116	78			X?	
		WV20	120	377	X?			
		WV39	348	134	*X (a)*			
		WV44	281	140		X		
		WV46	323	134		*X*		
McKenzie/Clinton	Silurian	WV6	223	58	X			
		WV7	287	24			X	
Clinton	Silurian	WV31	349	600				X
		WV39	348	134	*X (a)*			
		WV46	323	134		*X*		

Xlf is the low field magnetic susceptibility, RT-SIRM300K is the saturation remanence at room temperature. A1, A2, and A3 correspond to the magnetic assemblages identified in the study area. Samples labeled with (a) are believed to be altered based on the yellowish or reddish color after crushing. McKenzie, Needmore, and Harrell units are situated at the base of Tonoloway, Marcellus, and Brallier units, respectively. Note that the samples WV39 and WV46 are not well located (Tonoloway or Clinton strata).

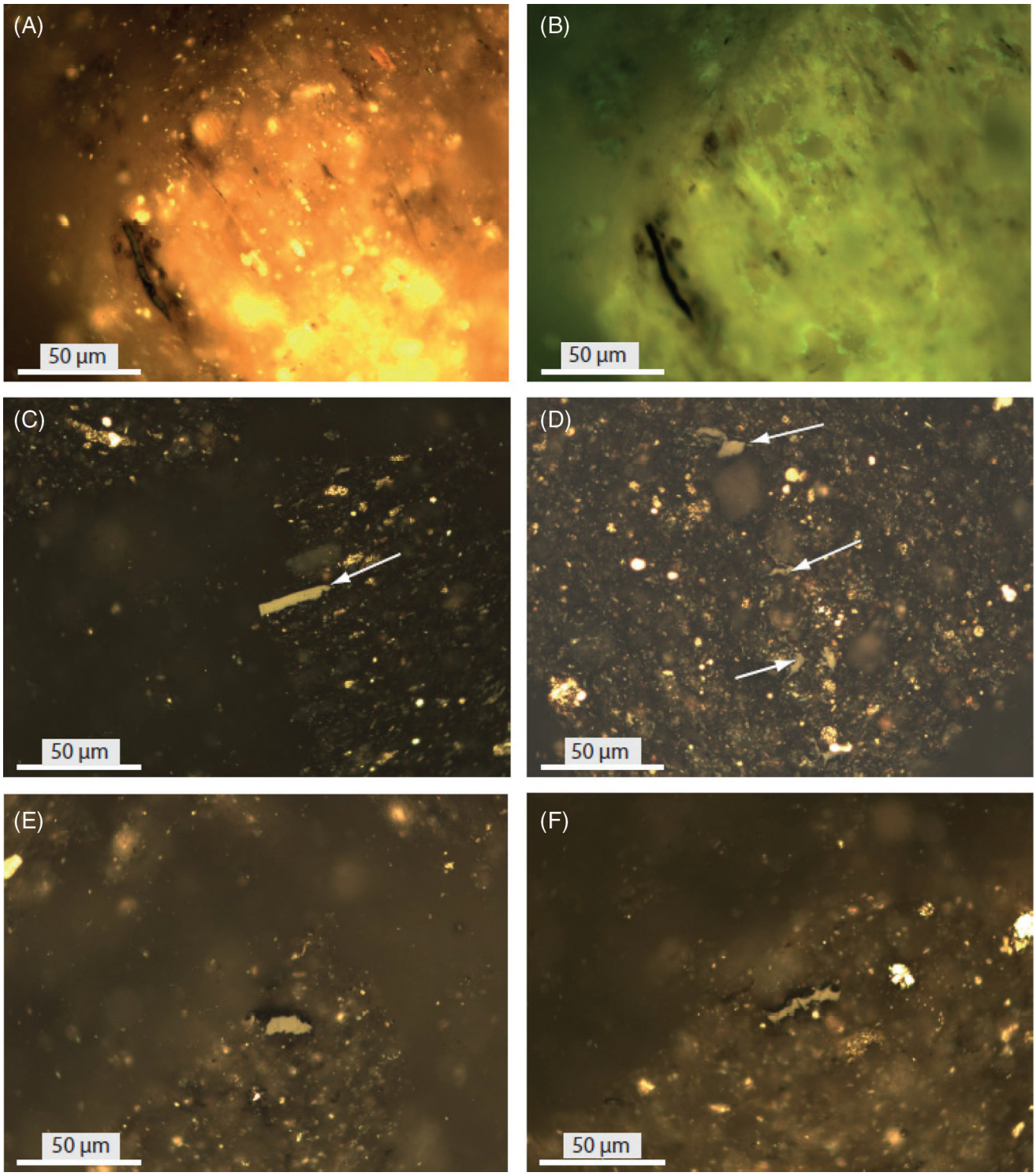

Figure S1. Marcellus Shale organic petrography. (A) Sample WV2 mineral matter. Very little content in organic matter particulate; (B) same as (A) but in fluorescent light (blue-violet excitation). Some organic components (transparent in white light) are part of this sample. Color in fluorescent light coincident with the vitrinite reflectance value that indicates a maturity stage of oil window; (C) Sample WV14 vitrinite particles (arrows); (D) Sample WV14 solid bitumens (arrows); (E) Sample WV43 vitrinite particles; (F) Sample WV43 bitumen particles. No fluorescence was observed for the samples WV14 and WV43. Images (A), (C), (D), (E), (F) were taken in optical microscopy, reflected white light, and in oil immersion.

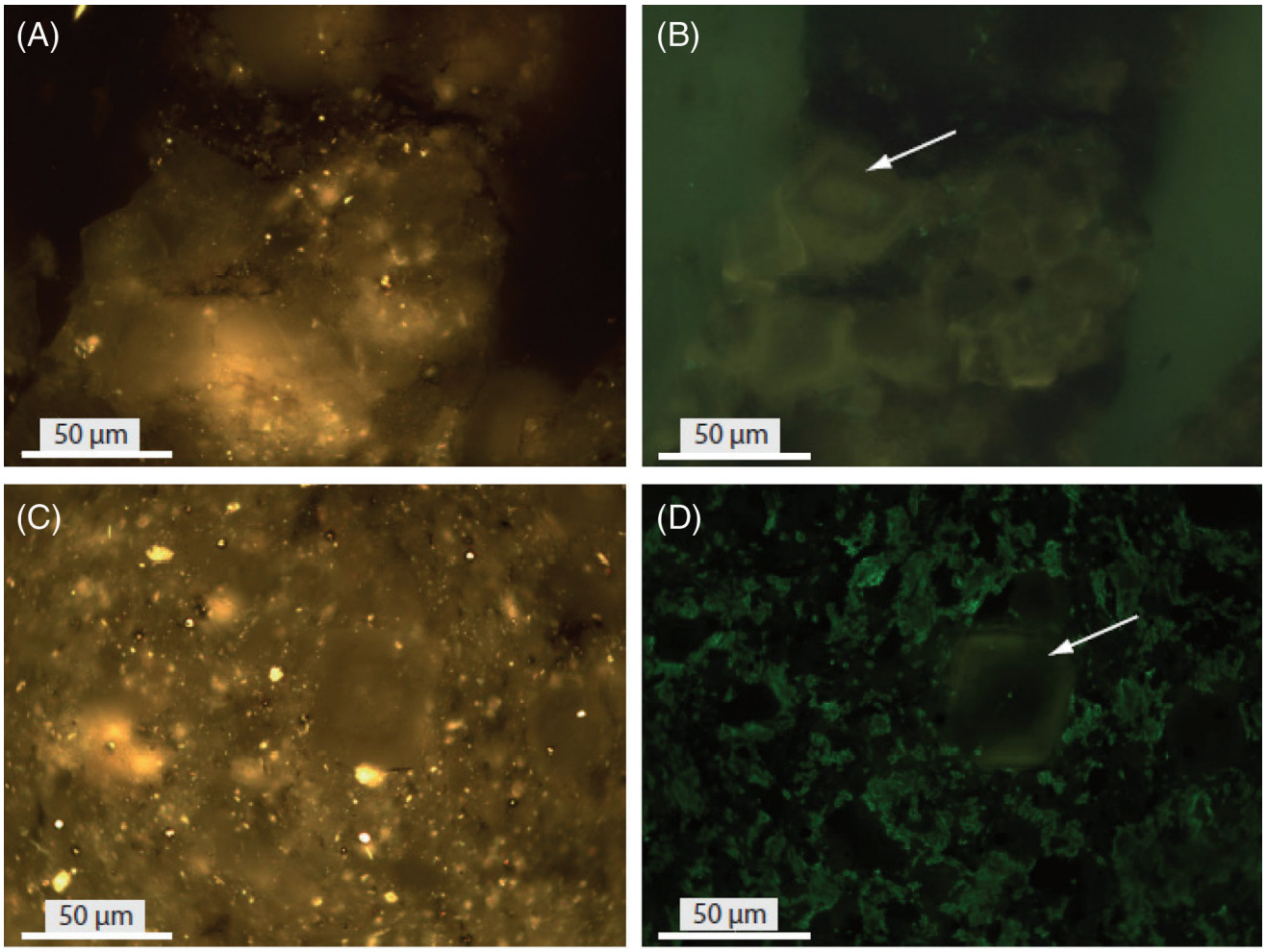

Figure S2. Tonoloway Limestone organic petrography. (A) Sample WV44 mineral matter. Very little content in organic matter particulate; (B) same as (A) but in fluorescent light (blue-violet excitation). Fluorescence is limited to the carbonates; (C) Sample WV46 mineral matter. Very little content in organic matter particulate; (D) same as (C) but in fluorescent light (blue-violet excitation). Fluorescence is limited to the carbonates. Images (A) and (C) were taken in optical microscopy, reflected white light, and in oil immersion.