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Supporting Information for

Magnetic properties of gas hydrate-bearing sediments and their association with iron geochemistry in the Sea of Marmara, Turkey

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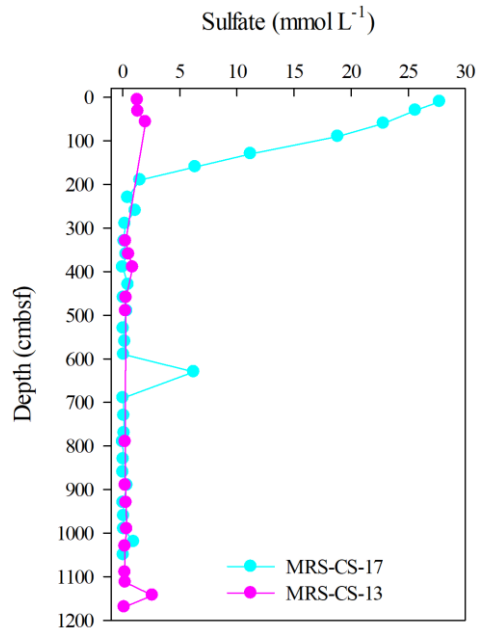


Fig. S1. Porewater sulfate concentration of core MRS-CS-13 (same site with MRS-CS-05) and MRS-CS-17 (same site with MRS-CS-16)

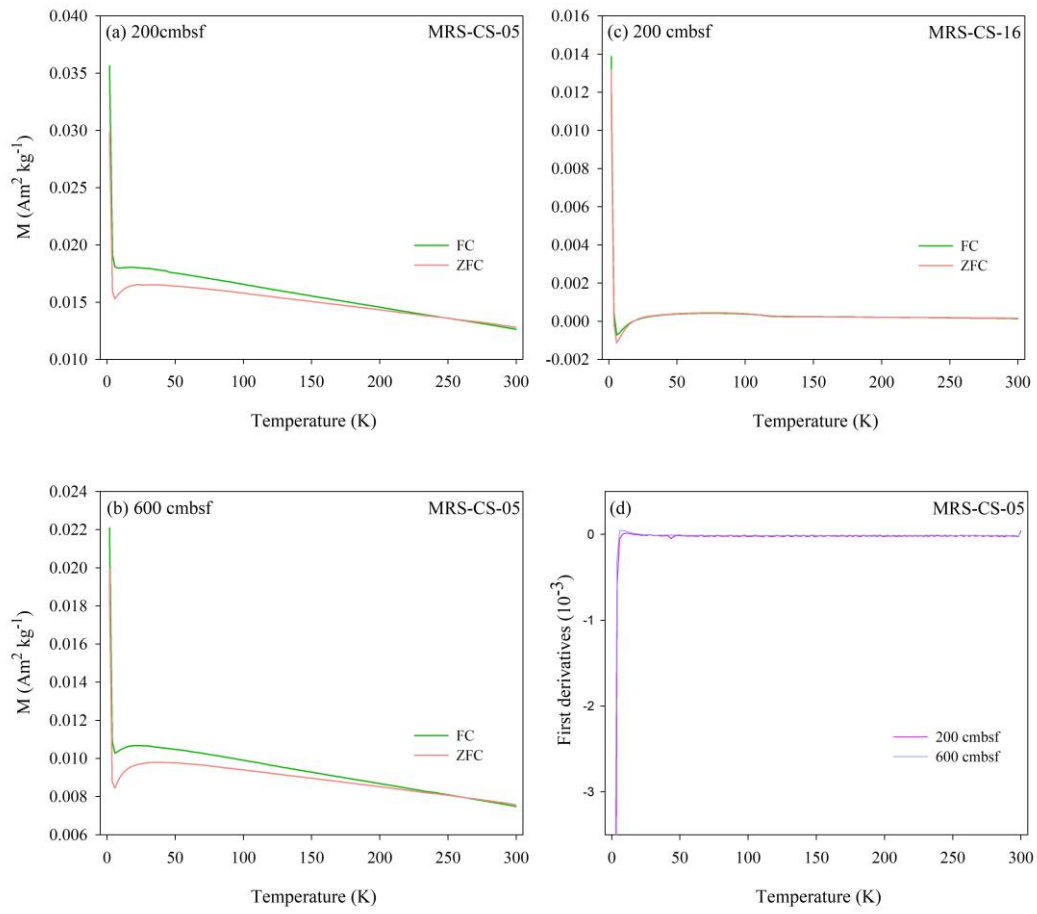


Fig. S2. Zero field-cooled (ZFC) and field-cooled (FC) curves for representative samples from the two selected cores.

Table S1 Magnetic characteristics of iron bearing minerals

Speciation	Mineral	Chemical form	Magnetic property	Magnetic susceptibility ($10^{-8} \text{ m}^3/\text{kg}$)	Curie or Néel temperature ($^{\circ}\text{C}$)
Iron oxides	Magnetite	Fe_3O_4	Ferrimagnetic	$5-10 \times 10^4$	580
	Hematite	$\alpha\text{-Fe}_2\text{O}_3$	Antiferromagnetic	58–78, 119–169	675
Iron	Goethite	$\alpha\text{-FeOOH}$	Antiferromagnetic	35, 38, 70, <126	120
(oxyhydr)oxides	Ferrihydrite	$\text{Fe}_5\text{HO}_8 \cdot 4\text{H}_2\text{O}$	Antiferromagnetic	100	-158–-258
	Lepidocrocite	$\gamma\text{-FeOOH}$	Paramagnetic	50–75, 69	-196
Iron carbonate	Siderite	FeCO_3	Paramagnetic	100	-238
Iron sulfides	Pyrite	FeS_2	Paramagnetic	30	—
	Monoclinic Pyrrhotite	$\text{Fe}_7\text{S}_8, \text{Fe}_{1-x}\text{S}$	Ferrimagnetic	5×10^3	320
	Hexagonal Pyrrhotite	$\text{Fe}_9\text{S}_{10}, \text{Fe}_{11}\text{S}_{12}$	Antiferromagnetic		
	Greigite	Fe_3S_4	Ferrimagnetic	$0.5-2 \times 10^4$	330

Note: “—” no solid data

Table S2 Correlations between magnetic susceptibility (χ) values and iron mineral contents

	χ	Fe _{carb} (dominantly siderite)	Fe _{ox1} (dominantly lepidocrocite)	Fe _{ox2} (dominantly hematite)	Fe _{mag} (dominantly magnetite)
MRS-CS-05					
χ	1	0.717	0.488	-0.022	-0.464
siderite		1	0.908**	-0.560	-0.541
lepidocrocite			1	-0.636	-0.561
hematite				1	0.276
magnetite					1
MRS-CS-16					
χ	1	0.575	0.190	0.872**	-0.314
siderite		1	0.535	0.247	-0.223
lepidocrocite			1	-0.196	0.221
hematite				1	-0.372
magnetite					1

Pearson correlation matrix by SPSS statistical software; ** correlation is significant at the 0.01 level.