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Hysteresis Loops For Various Ceramic Magnetism Ferrites

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Hysteresis loops of some commercial ferrites were measured in the HCS lab and compared with published data from the manufacturer (Ceramic Magnetism – CMI).

Table 1 Comparison of hysteresis loop parameters between HCS lab data and manufacturer's data

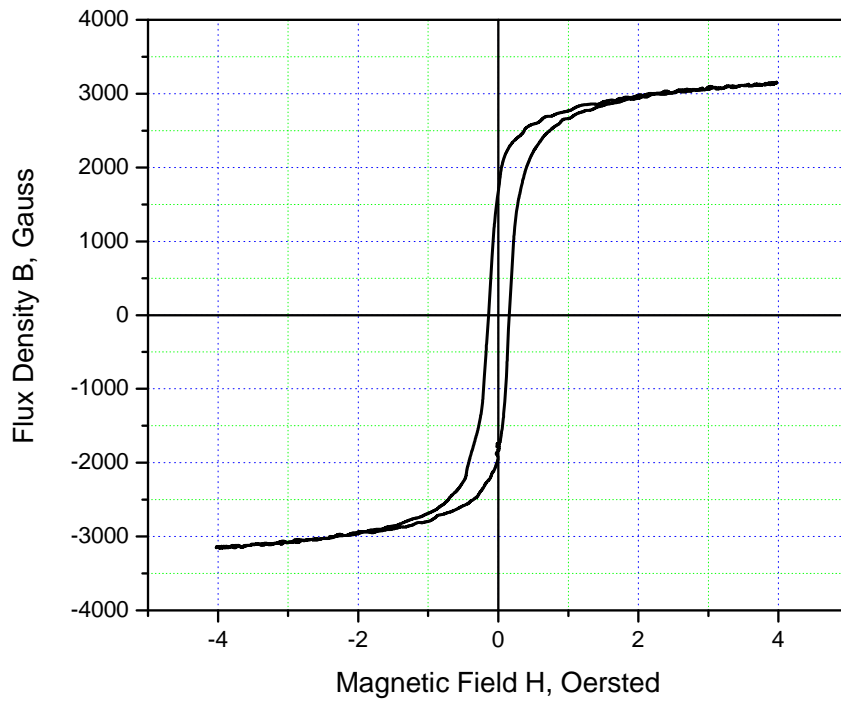
Sample	HCS lab measurements, 0.05 Hz			Manufacture's data sheets, 1 kHz		
	Br, Gauss	Hc, Oe	Bs, Gauss	Br, Gauss	Hc, Oe	Bs, Gauss
	At 4 Oe		At 20 Oe	At 5 Oe		At 20 Oe
CMD5005	1750	0.15	3300	1700 ¹	0.30 ¹	3200 ¹
CN20	2500	0.25	3850	2000 ¹	0.50 ¹	3800 ¹
CM400	2845	0.70	4200	2400	0.65	4600 ²
CMD10	3300	0.40	4400	2900	0.36	4300
MN67	3600	0.14	5400	2100	0.15	5250
N40	500 ⁴	6.1 ⁴	-	850 ^{1,3}	10.5 ^{1,3}	2700 ^{1,3}

1. Measured at 10 kHz
2. Measured at 50 Oe
3. Measured at 100 Oe
4. Measured at 20 Oe

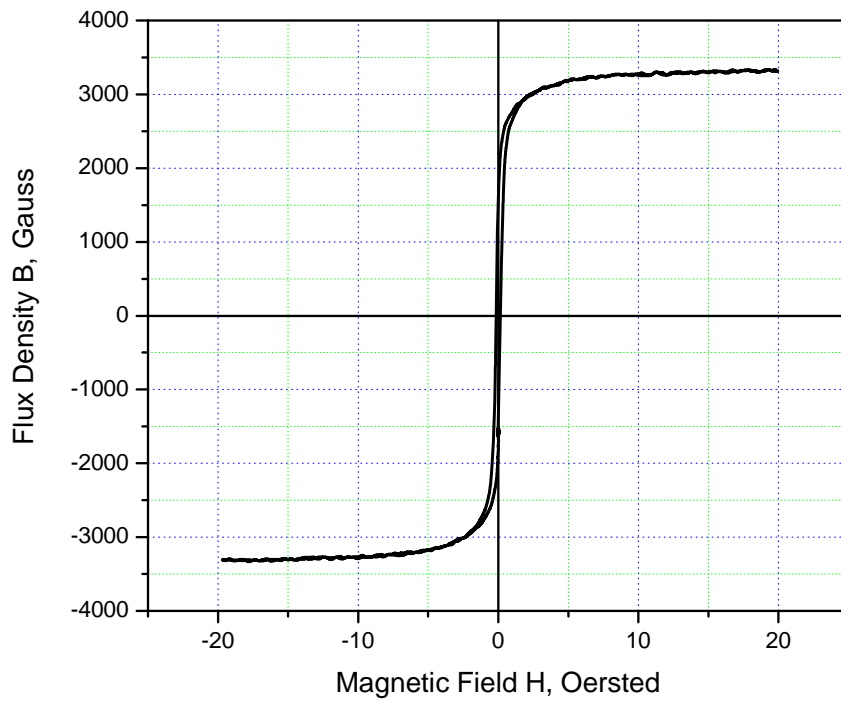
The CMI samples measured were chosen from a set of 24 isostatically pressed grades, 4 different sintering schedules for each of the 6 different types. Single representative sample were taken from each of the 6 types. These were chosen on the basis of having the highest initial permeability as tested at HCS on January 3, 2011.

Two plots per sample are shown except for N40. The first is at low field to more accurately ascertain Br & Hc. The second plot is at higher field to measure Bs.

CMD5005-1 B-H Loops

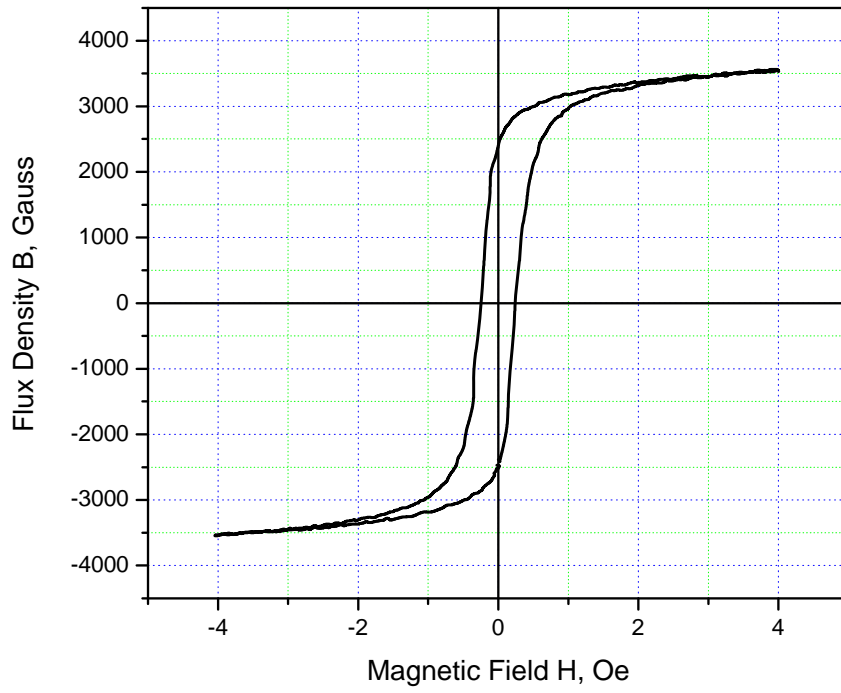


Br ~ 1750 Gauss, Hc ~ 0.15 Oe, measured at 4 Oersted

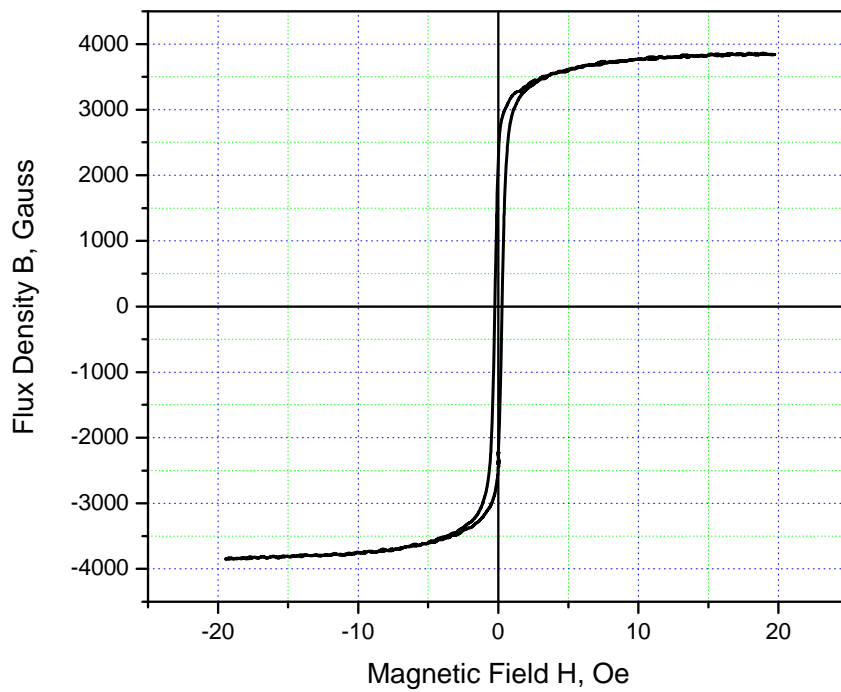


Bs ~ 3300 Gauss at 20 Oersted, measured at 20 Oersted

CN20-1 B-H Loops

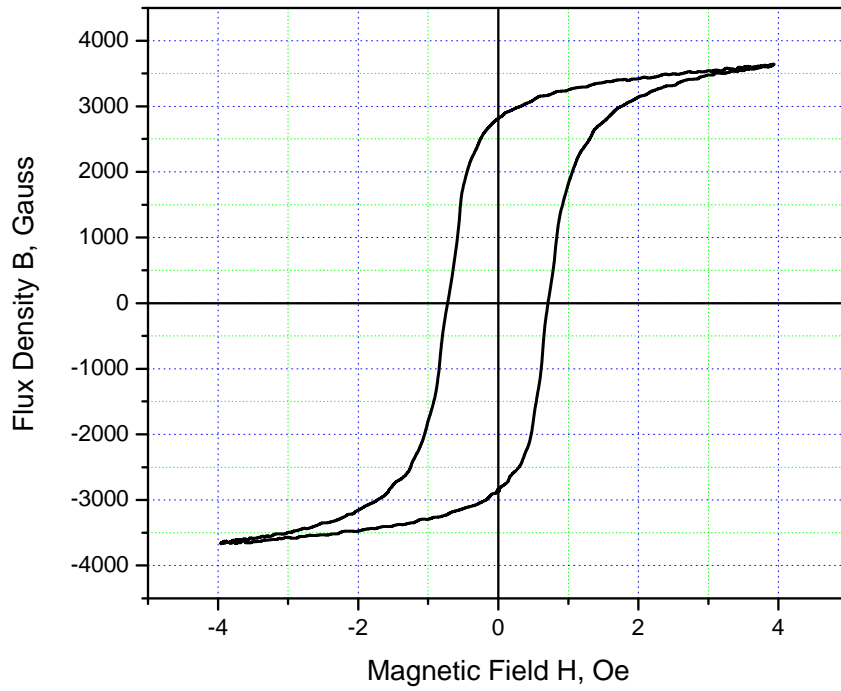


Br ~ 2500 Gauss, Hc ~ 0.25 Oersted, measured at 4 Oersted

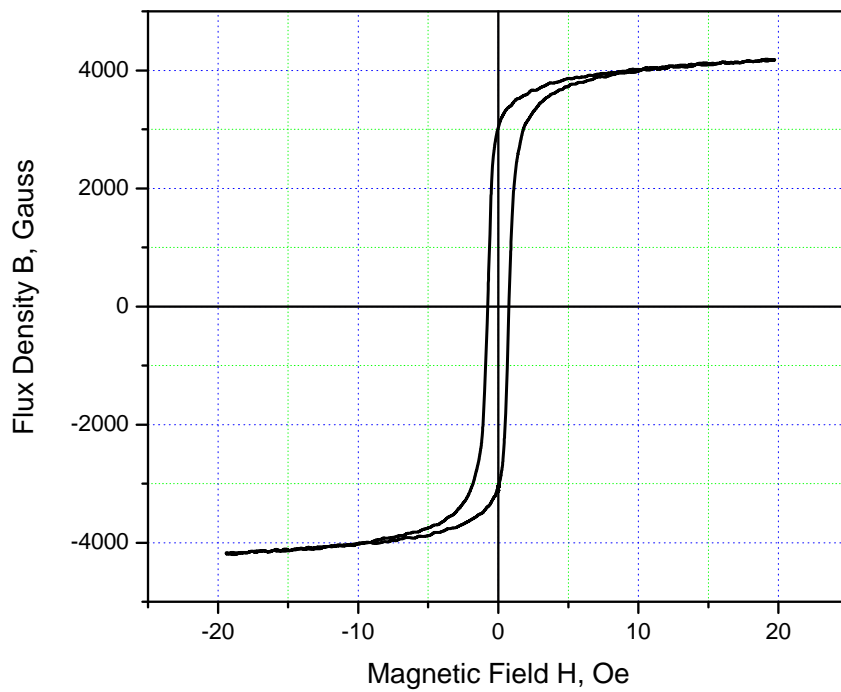


B_S ~ 3850 Gauss, measured at 20 Oersted

CM400-1 B-H Loops

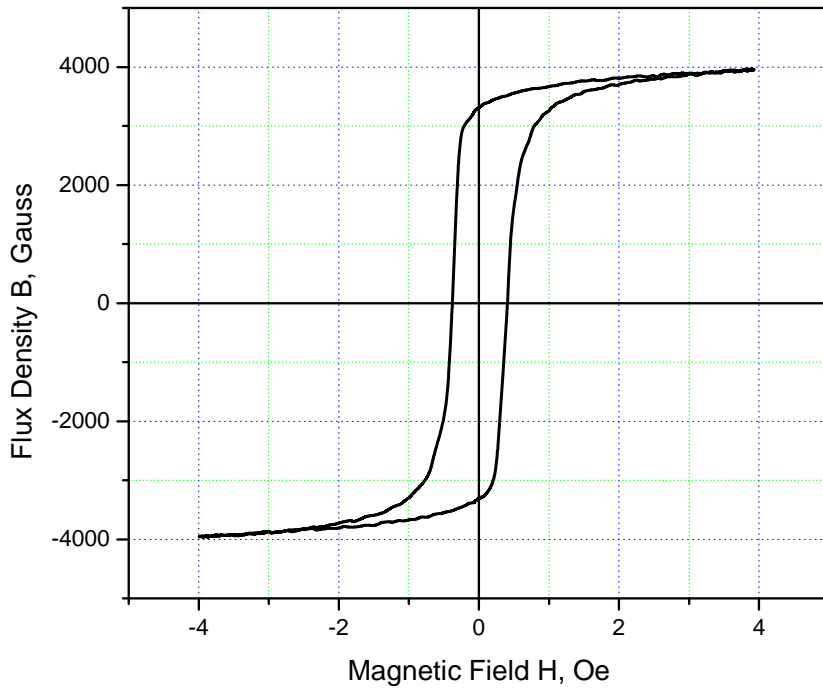


$B_r \sim 2845$ Gauss, $H_c \sim 0.70$ Oersted, measured at 4 Oersted

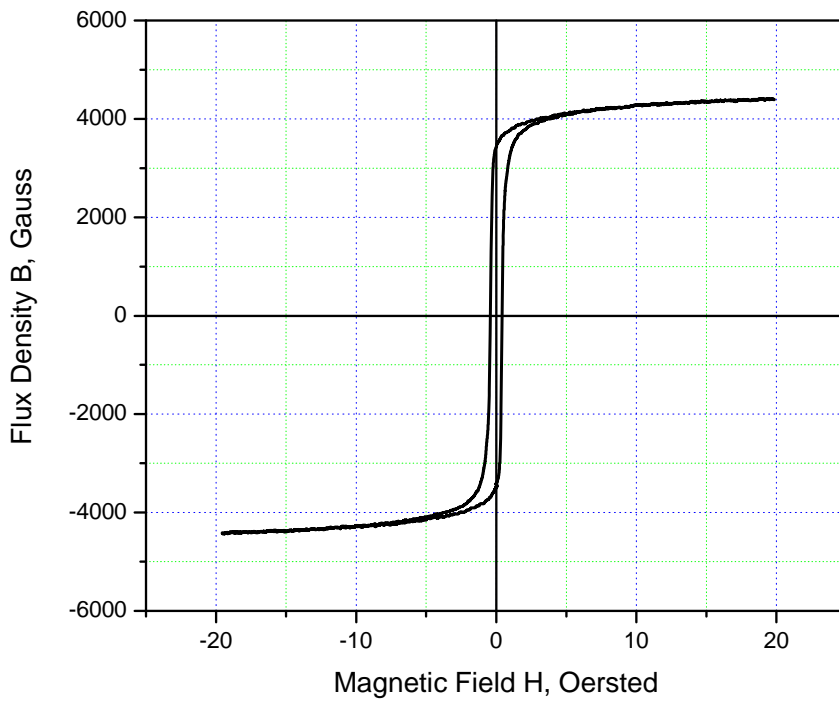


$B_S \sim 4200$ Gauss, measured at 20 Oersted

CMD10-1 B-H Loops

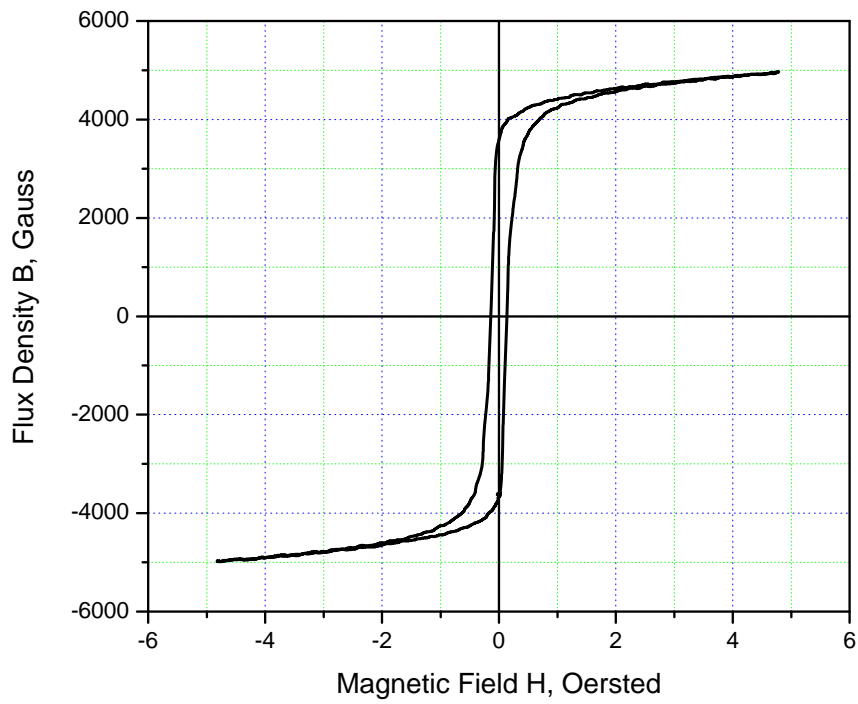


$B_r \sim 3300$ Gauss, $H_c \sim 0.40$ Oersted, measured at 4 Oersted

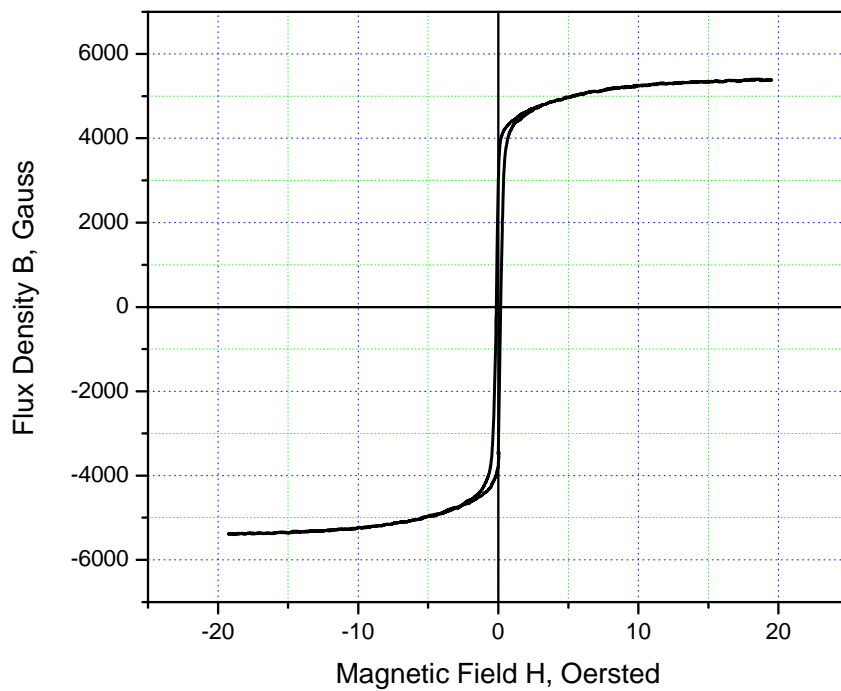


$B_s \sim 4400$ Gauss, measured at 20 Oersted

MN67-4 B-H Loops

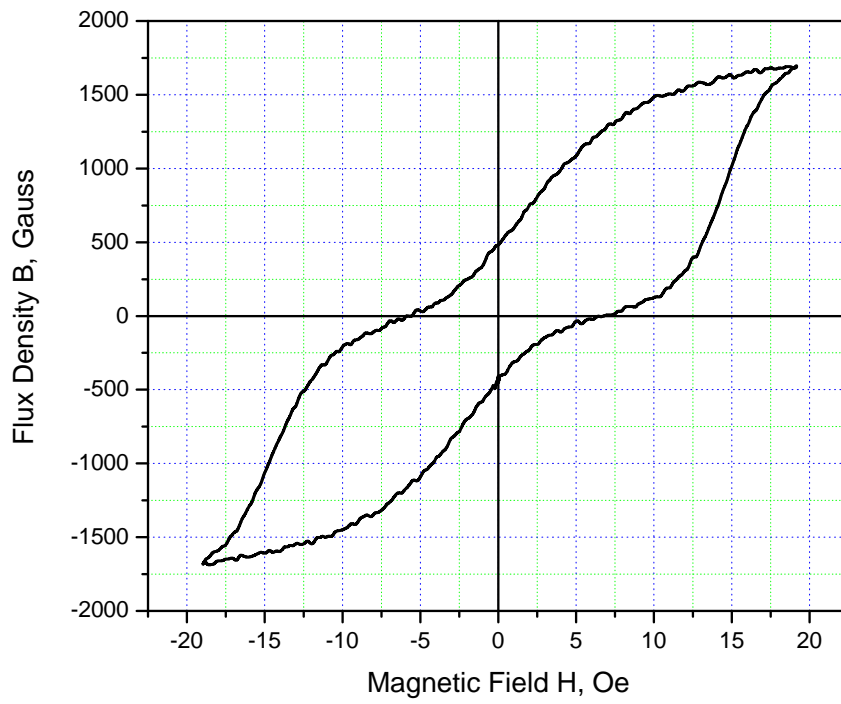


Br ~3600 Gauss, Hc ~ 0.14 Oersted, measured at 4 Oersted



Bs ~ 5400 Gauss, measured at 20 Oersted

N40-1 B-H Loops



Br ~ 500 Gauss, Hc ~ 6.1 Oersted, measured at 20 Oersted