

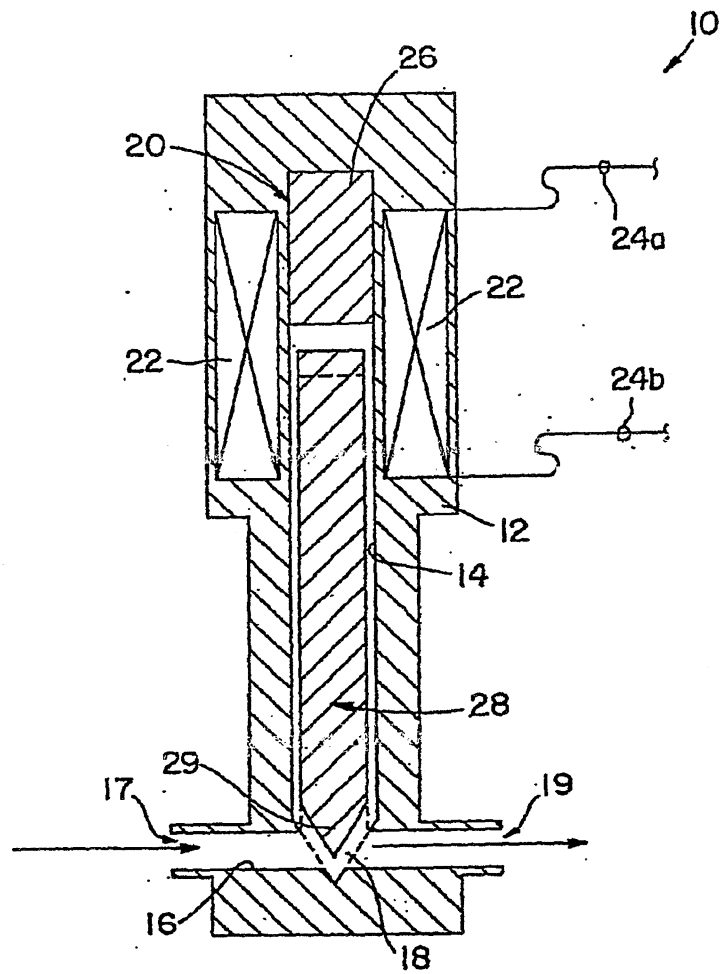


FIG. 1

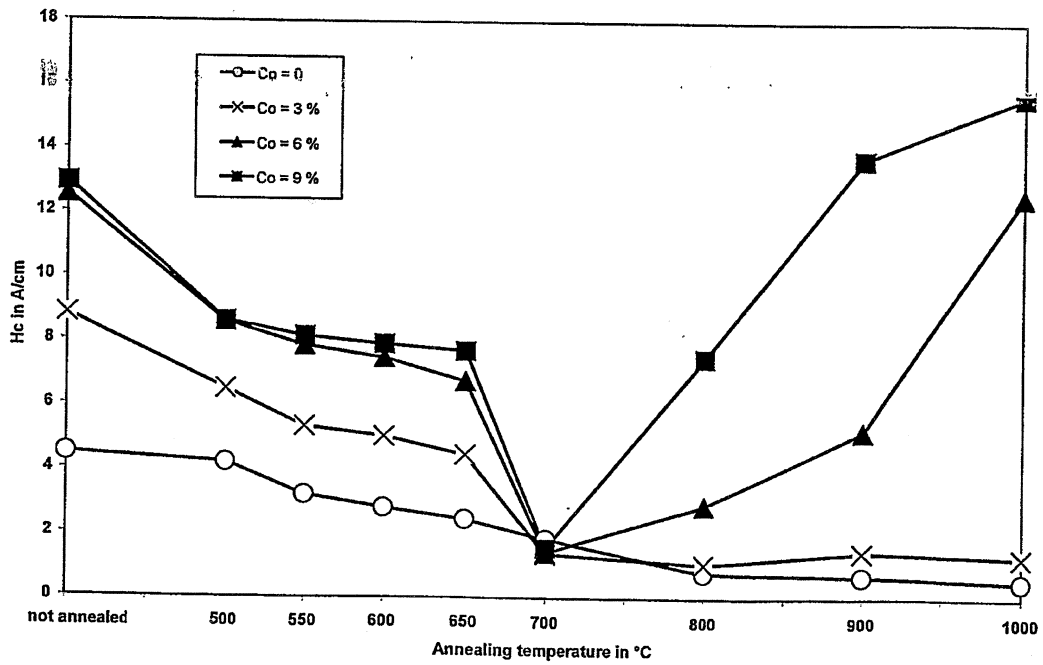
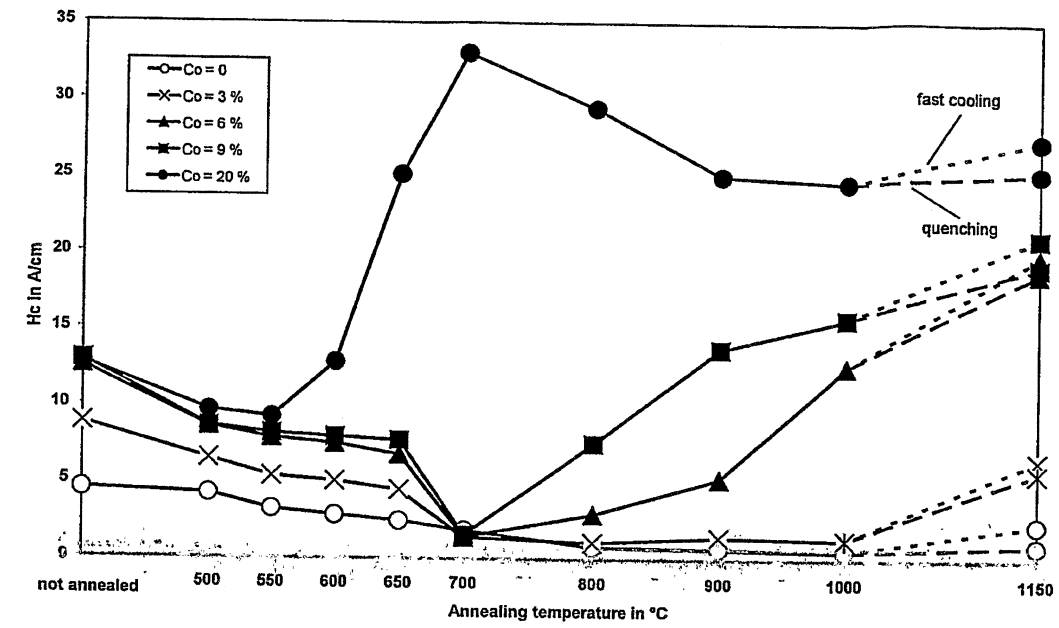


Fig. 2: dc-coercivity versus annealing temperature

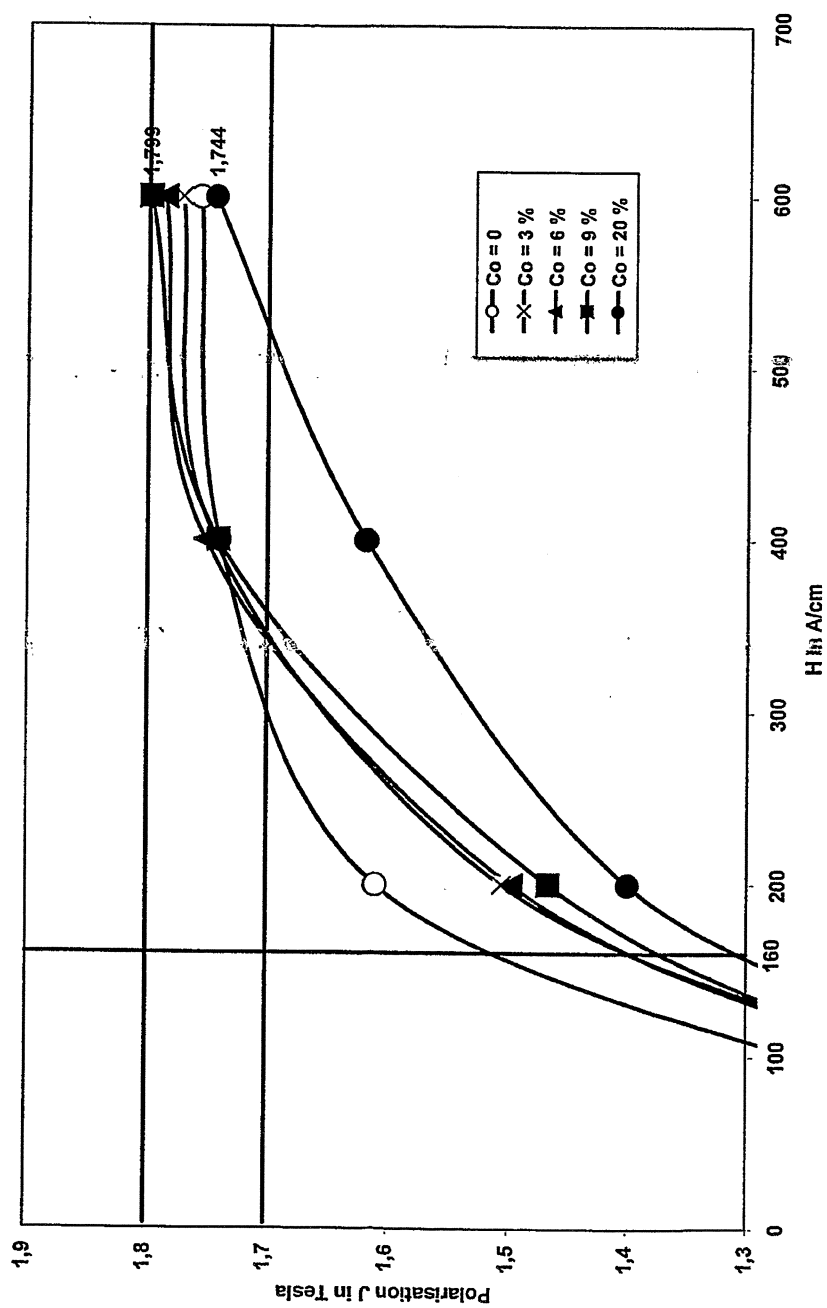


Fig. 3: dc virgin curve in the unannealed condition

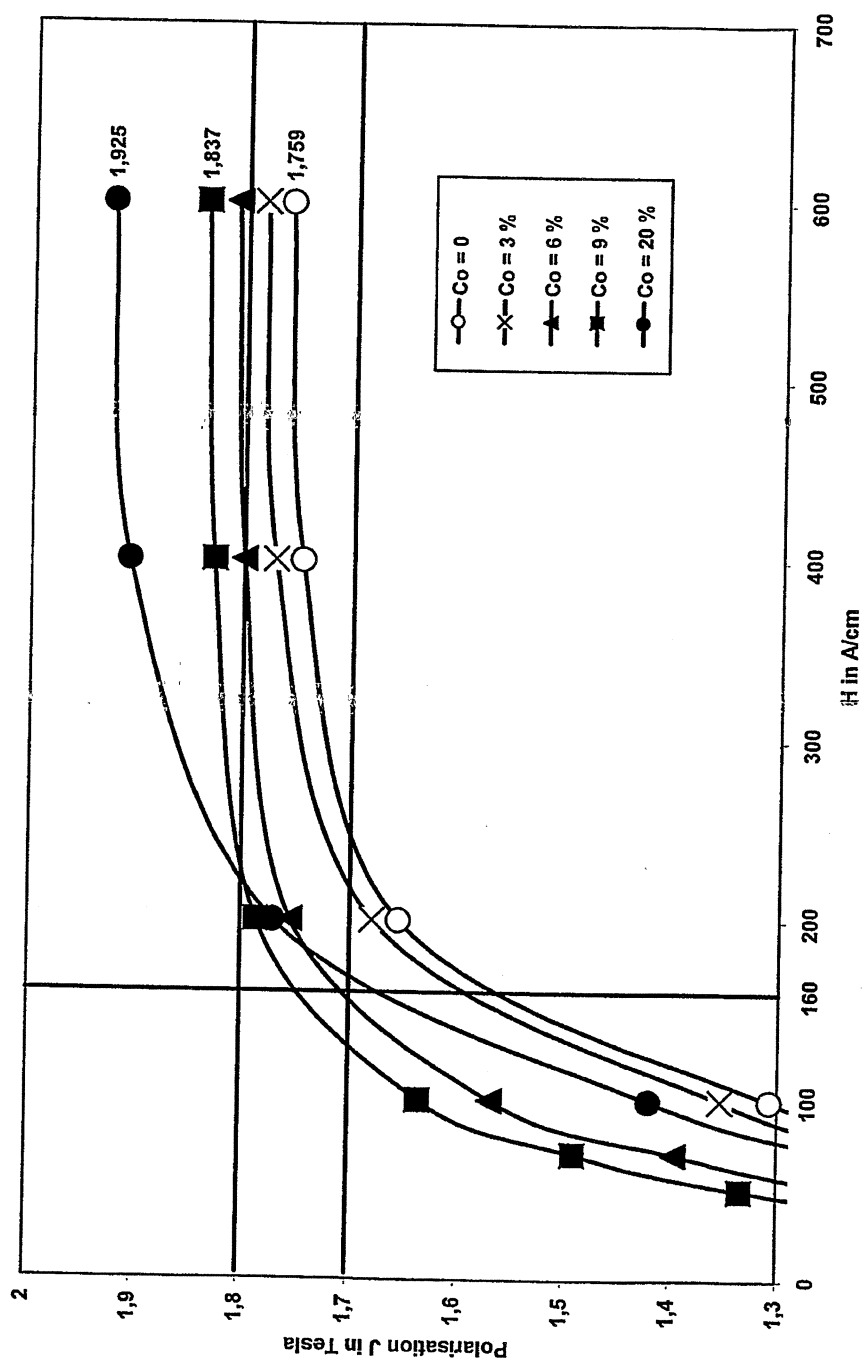


Fig. 4: dc virgin curve after 5 h annealing at 500 °C

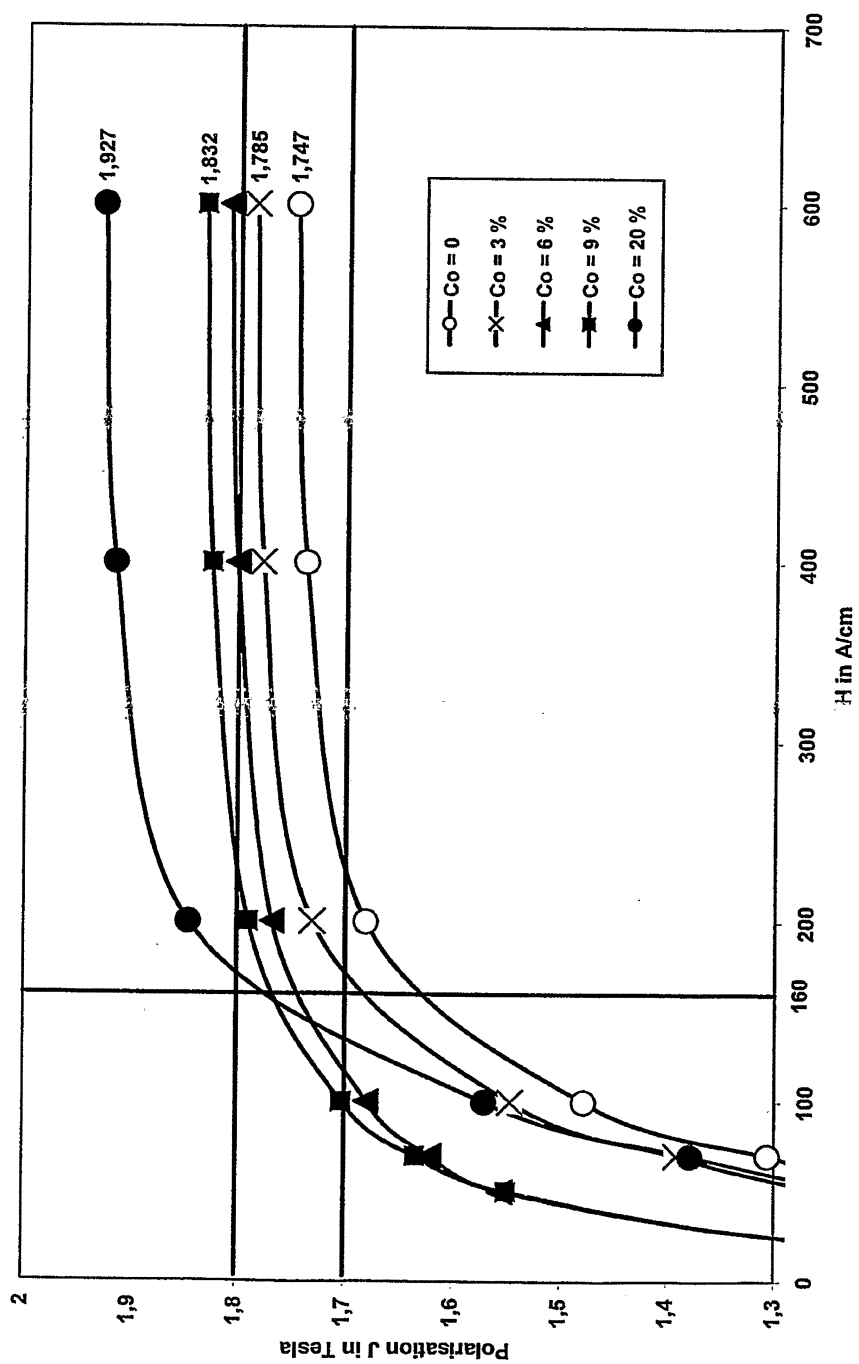


Fig. 5: dc virgin curve after 5 h annealing at 550 °C

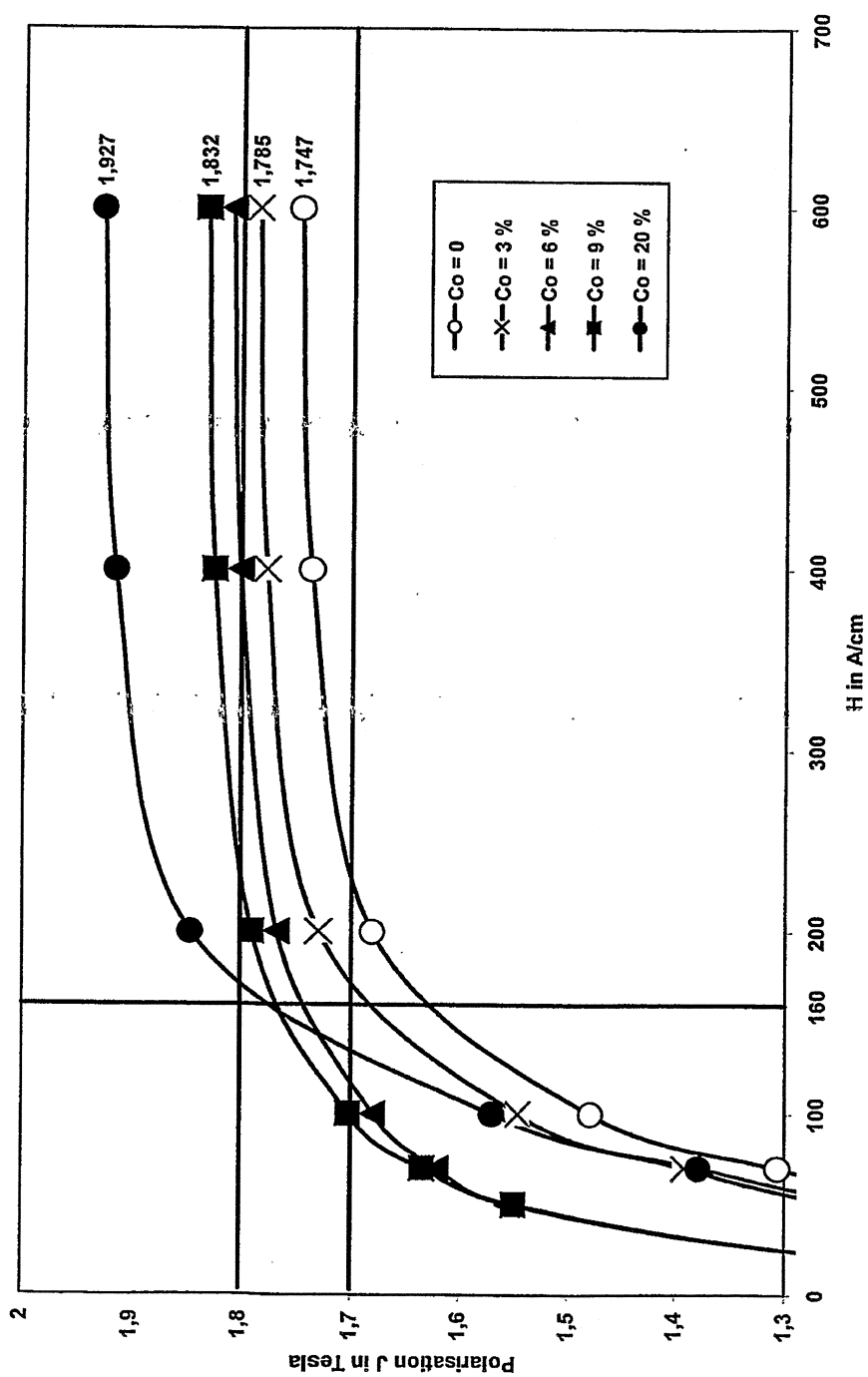


Fig. 6: dc virgin curve after 5 h annealing at 600 °C

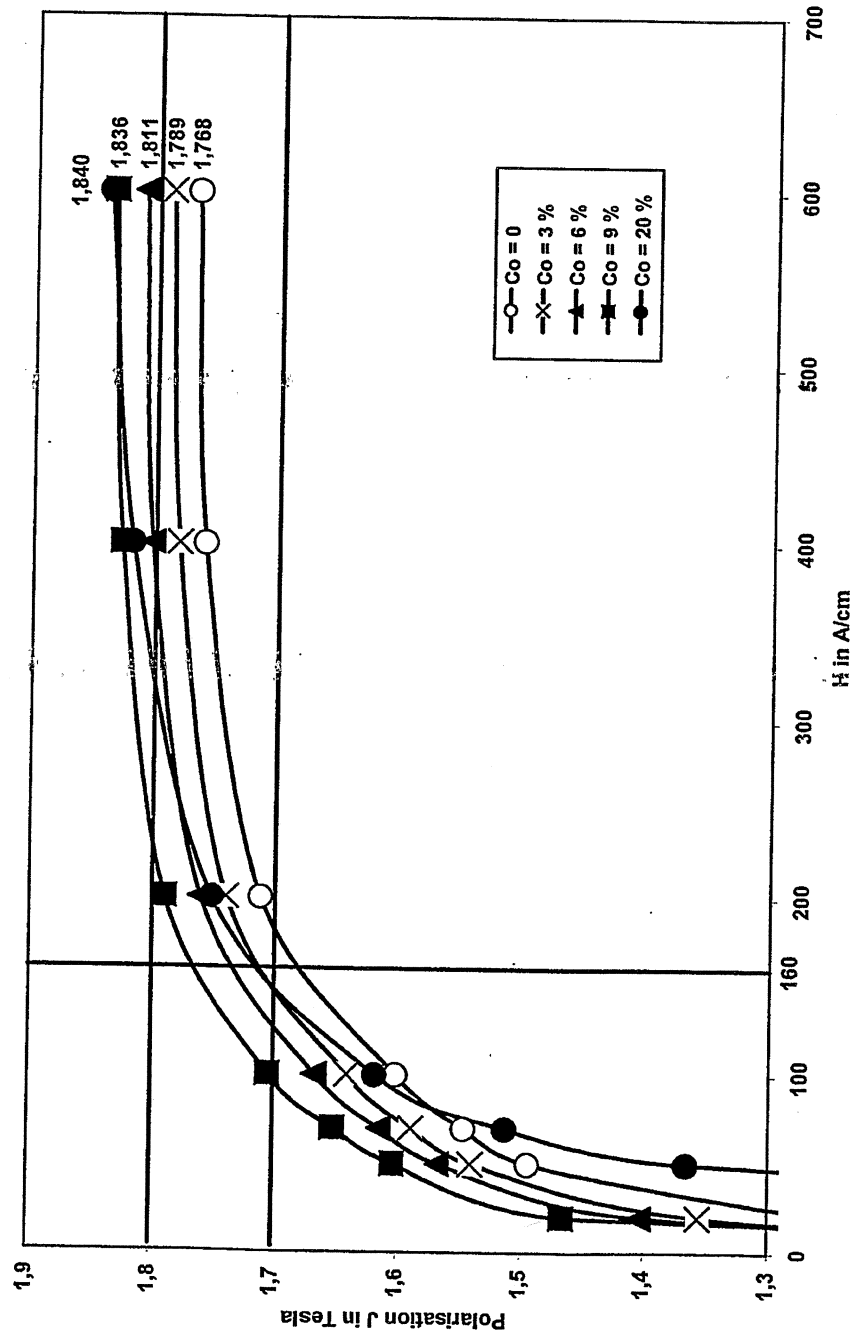


Fig. 7: dc virgin curve after 5 h annealing at 650 °C

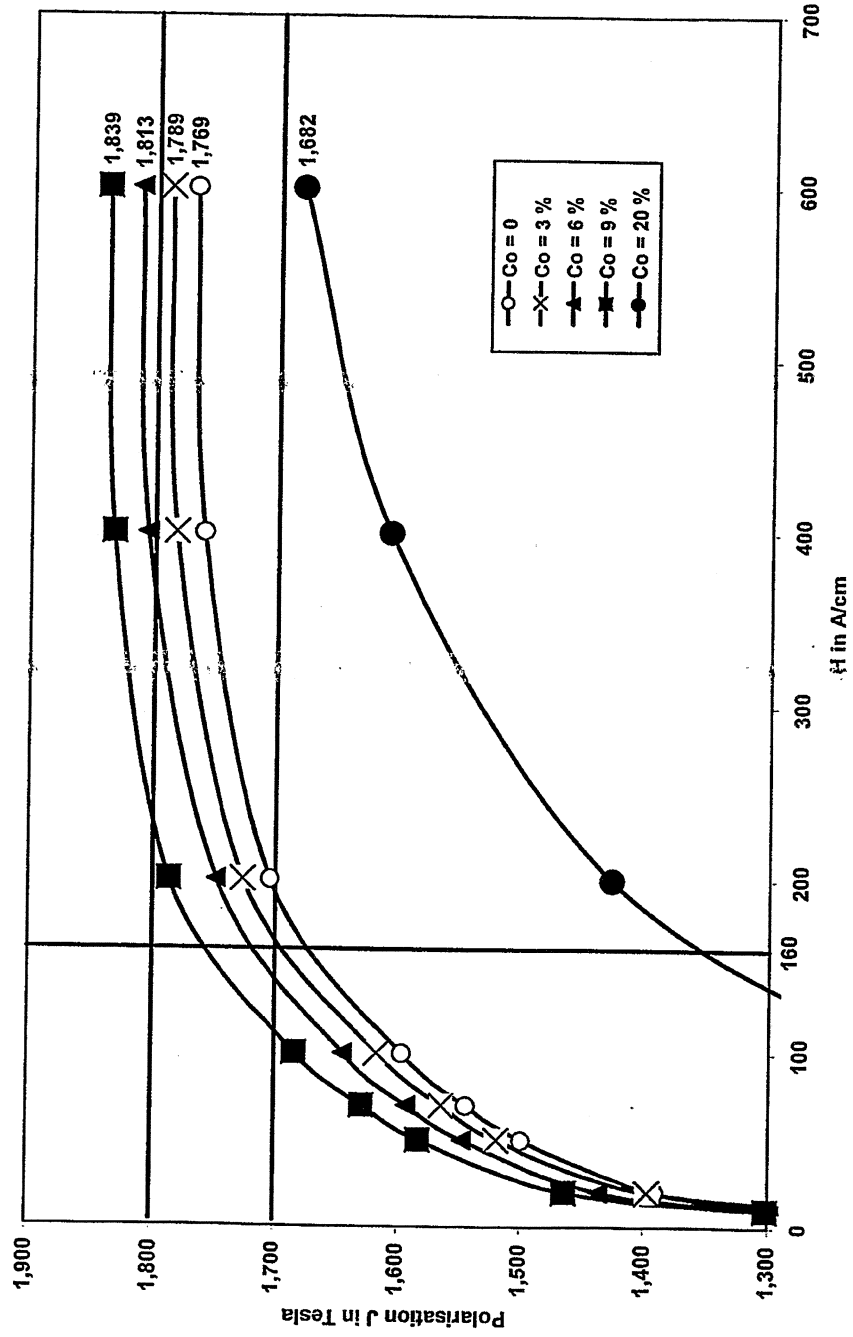


Fig. 8: dc virgin curve after 5 h annealing at 700 °C

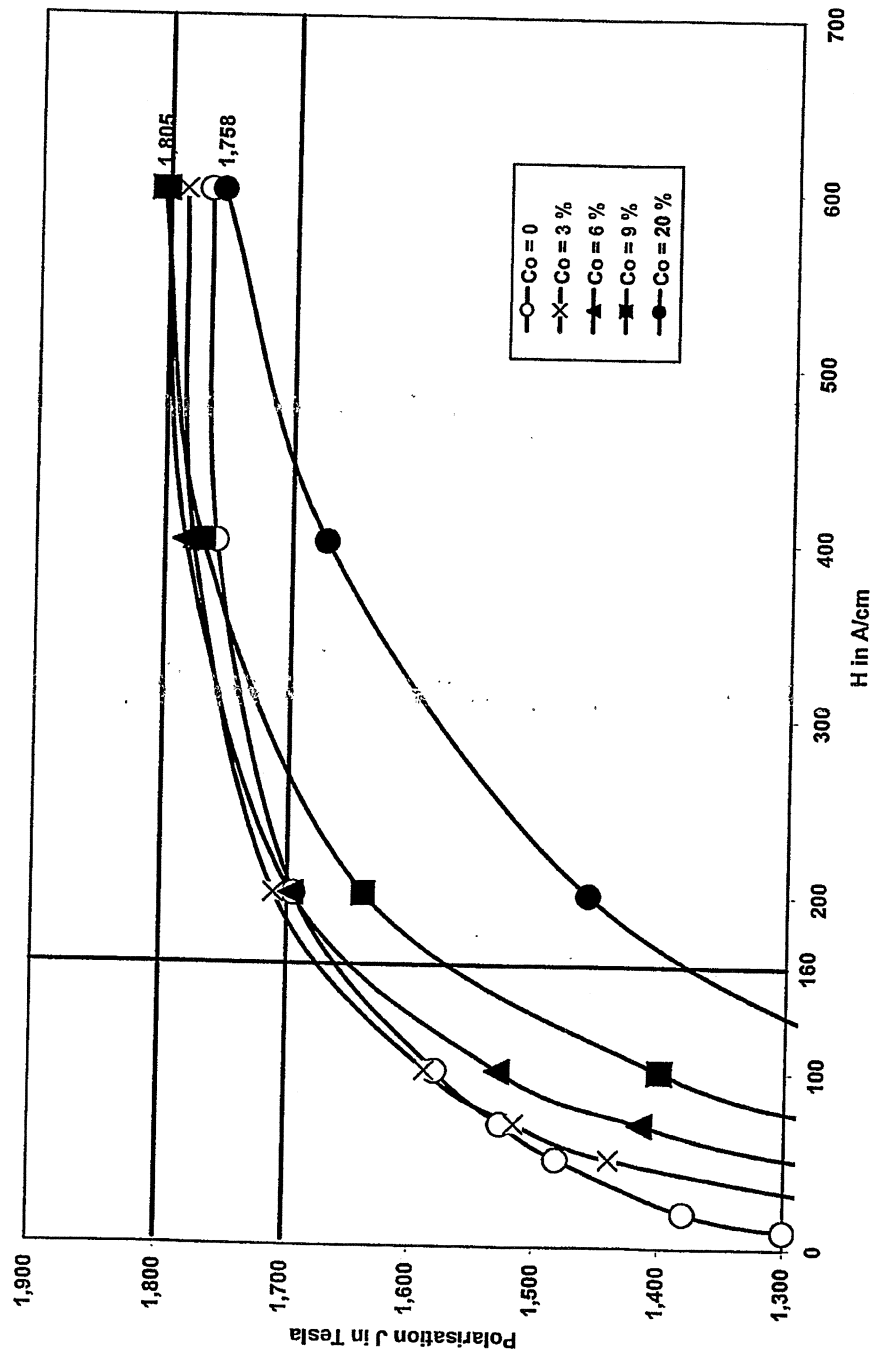


Fig. 9: dc virgin curve after 5 h annealing at 800 °C

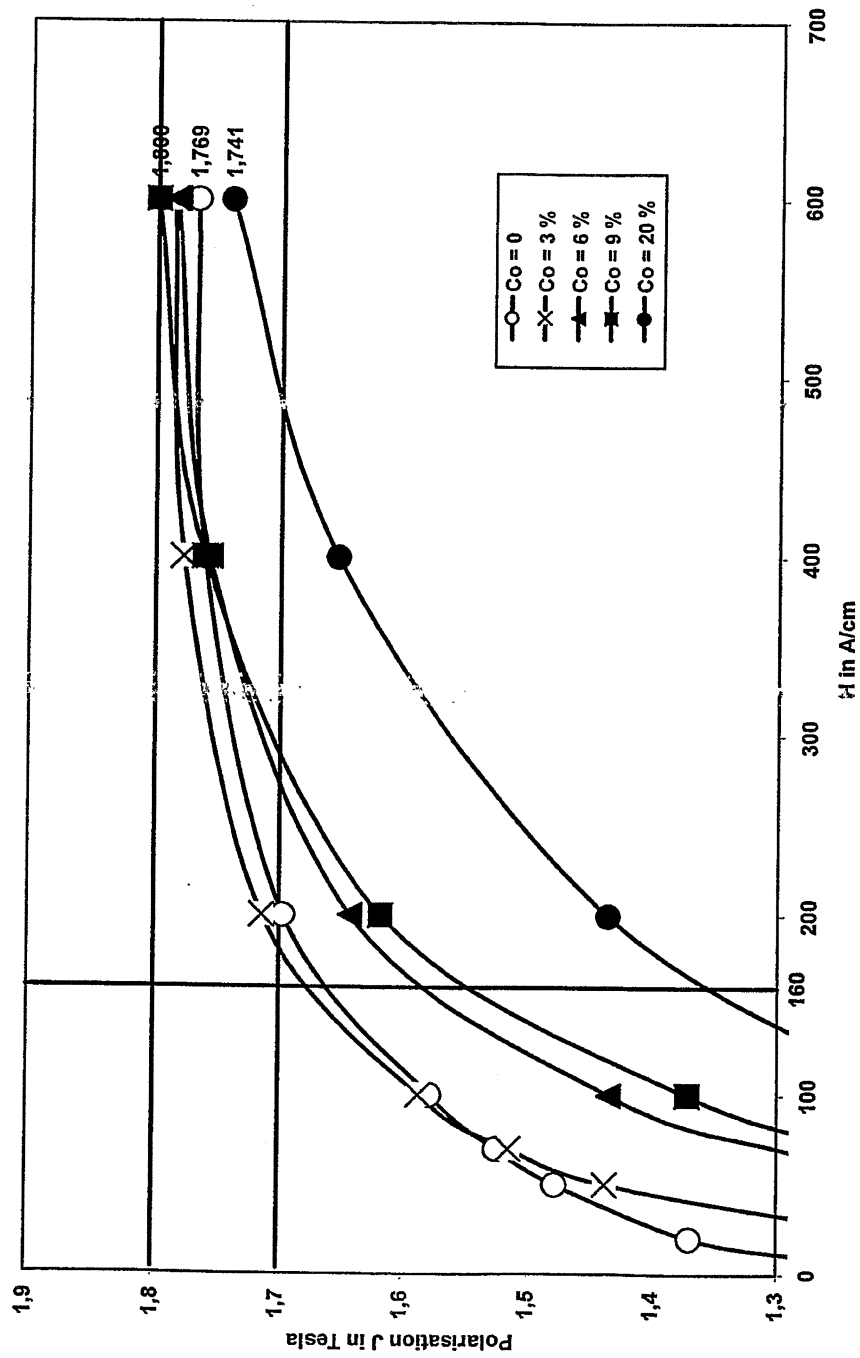


Fig. 10: dc virgin curve after 5 h annealing at 900 °C

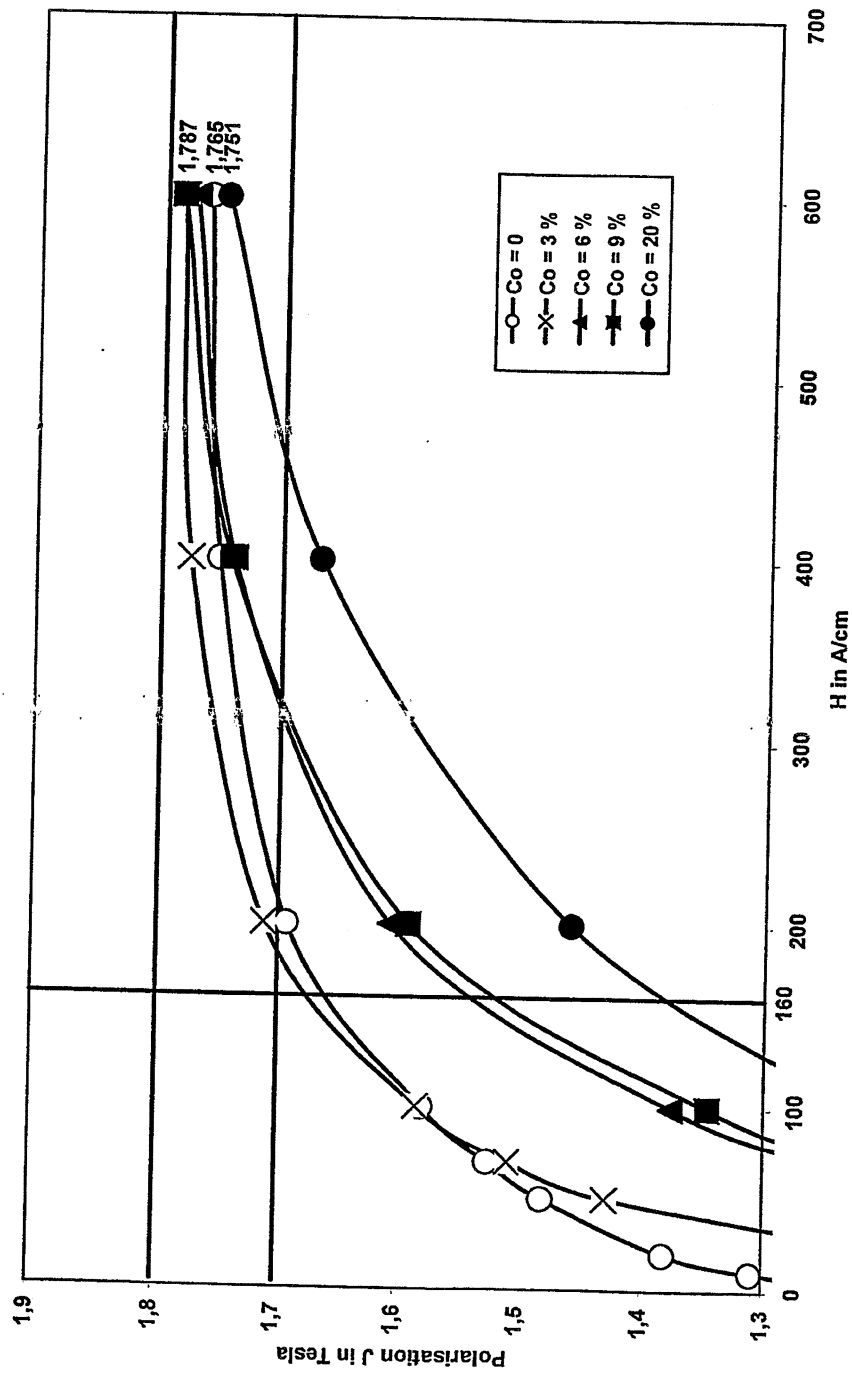


Fig. 11: dc virgin curve after 5 h annealing at 1000 °C

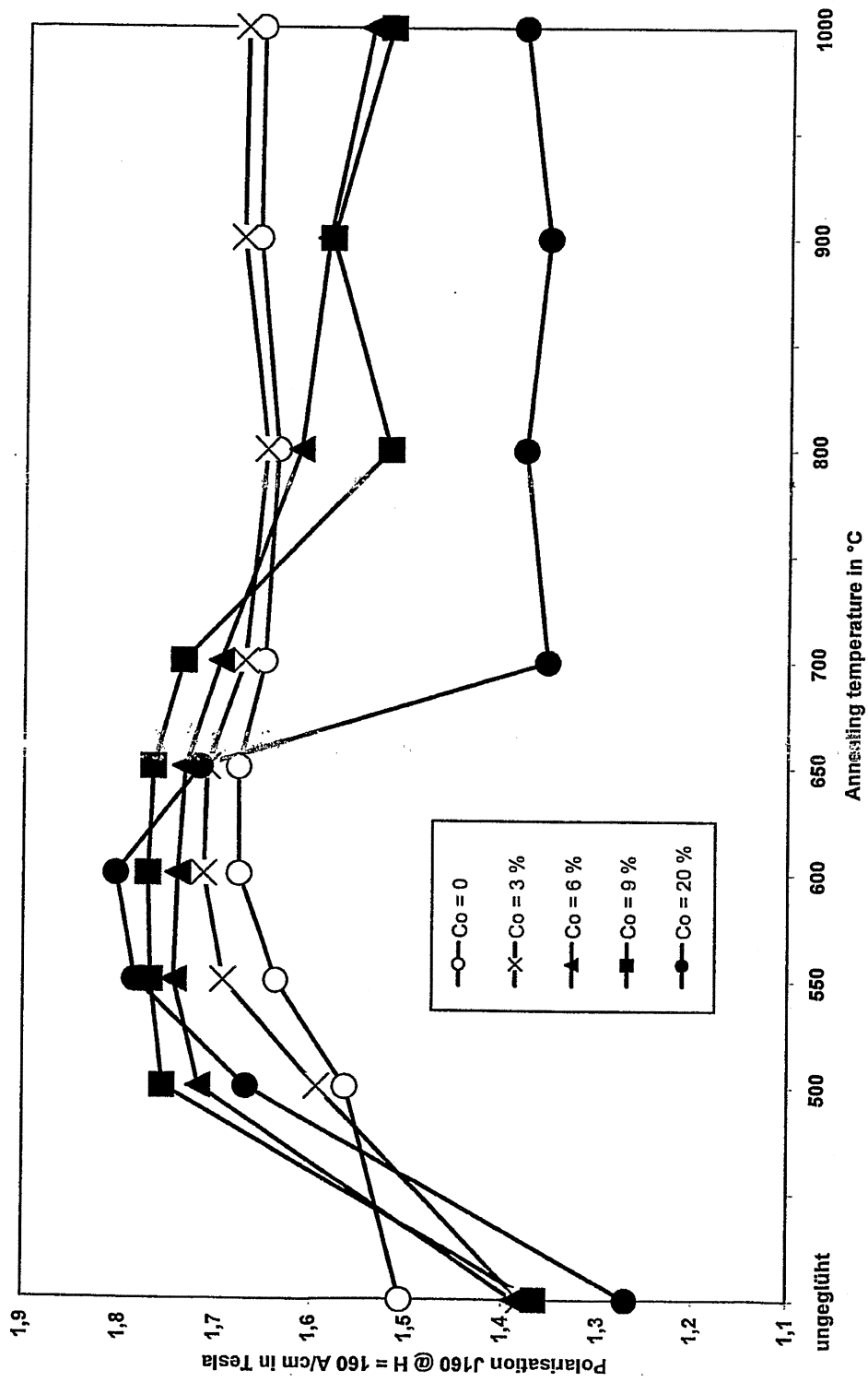


Fig. 12: Polarisation J_{160} at $H = 160$ A/cm versus annealing temperature

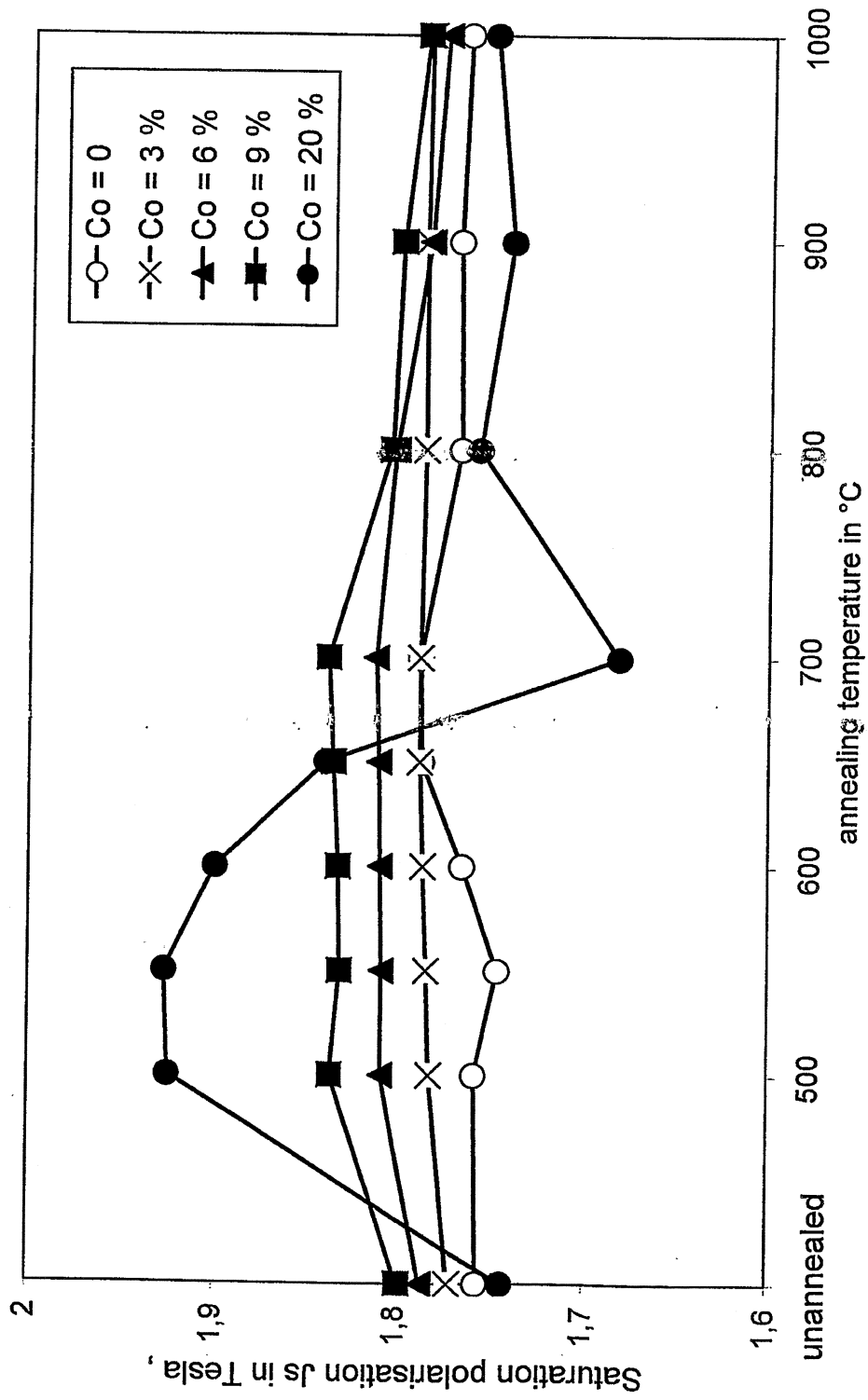


Fig. 13: Saturation polarisation J_s at $H = 600$ A/cm versus annealing temperature

Batch No.	Fe (wt%)	Co (wt%)	Cr (wt%)
93/7215	rest	0	13
93/7216	rest	3	13
93/7217	rest	6	13
93/7218	rest	9	13
93/7342	rest	20	13

Table 1

Annealing temperature (°C)	93/7215 Co= 0 wt%	93/7216 Co= 3 wt%	93/7217 Co= 6 wt%	93/7218 Co= 9 wt%	93/7219 Co=20 wt%
unannealed	4.50	8.82	12.54	12.93	12.81
500	4.21	6.49	8.59	8.61	9.64
550	3.21	5.33	7.85	8.14	9.21
600	2.81	5.03	7.47	7.90	12.80
650	2.46	4.47	6.76	7.70	25.10
700	1.85	1.38	1.42	1.57	33.00
800	0.79	1.07	2.90	7.49	29.40
900	0.69	1.44	5.22	13.71	25.00
1000	0.53	1.29	12.55	15.69	24.60

Table 2

Batch No.	Co content (wt%)	Resistivity ($\mu\Omega\text{m}$)
93/7215	0	0.428
93/7216	3	0.485
93/7217	6	0.539
93/7218	9	0.582
93/7342	20	0.768

Table 3

Alloy	H _c (A/cm)	J _s (T)	J ₁₆₀ (T)	μ (max)	ρ (μΩm)
93/7218 (13 wt% Cr, 9 wt% Co, rest Fe)	1.57	1.84	1.767	1,320	0.58
93/7215 (13 wt% Cr, 0 wt% Co, rest Fe)	0.53	1.765	1.657	1,788	0.43
VACOFLUX 17	≤ 2.0	2.22	> 2.0	2,500	0.39
VACOFER S1	≤ 0.12	2.15	1.97	40,000	0.10

Table 4

Alloy	Observable change (after 14 days)
VACOFLUX 17	Black corrosion product on the side faces
VACOFLUX 50	Two small rust spots on the surface
93/7215 (0wt% Co)	Black corrosion product on the side faces
93/7216 (3wt% Co)	No change observed
93/7217 (6wt% Co)	No change observed
93/7218 (9wt% Co)	No change observed
93/7342 (20wt% Co)	A little darker

Table 5

Alloy	Observable change (after 150 hours at 130°C in gasoline/methanol/corrosive wafer solution)
VACOFLUX 17	Corrosion pitting
VACOFLUX 50	Corrosion pitting, structure visible
93/7215 (0wt% Co)	No change observed
93/7216 (3wt% Co)	No change observed
93/7217 (6wt% Co)	Small corrosion spots on one side
93/7218 (9wt% Co)	No change observed
93/7342 (20wt% Co)	Isolated small corrosion spots

Table 6

Alloy	Optical evaluation after 92 hours	Degradation (after removal of the corrosion product)	Optical evaluation after 258 hours	Optical evaluation after removal of the corrosion product	Degradation (after removal of the corrosion product)
VACOFLEX 17	Completely covered with a red oxide layer	36.5 mg 32.6 g/m ² d	Completely covered with a red oxide layer	Microstructure visible; matt dark grey discolouration	57.6 mg 18.4 g/m ² d
VACOFLEX 50	Grey discolouration, microstructure visible	39.1 mg 33.0 g/m ² d	Blue discolouration; microstructure visible	Microstructure visible; matt light grey discolouration	52.0 mg 15.6 g/m ² d
93/7215 (0wt% Co)	Yellow discolouration, microstructure partly visible	18.2 mg 15.4 g/m ² d	Brown discolouration; Microstructure visible	Microstructure visible	37.3 mg 11.2 g/m ² d
93/7216 (3wt% Co)	Blank, microstructure partly visible	25.5 mg 21.6 g/m ² d	Grey discolouration with light regions	Microstructure visible in some regions	30.8 mg 9.29 g/m ² d
93/7217 (6wt% Co)	Yellow discolouration	15.5 mg 13.1 g/m ² d	Matt grey discolouration	Partly matt and partly shiny grey	15.6 mg 4.69 g/m ² d
93/7218 (9wt% Co)	Yellow discolouration	16.7 mg 13.9 g/m ² d	Green matt discolouration	Partly matt and partly shiny grey	16.8 mg 5.00 g/m ² d
93/7342 (20wt% Co)	Completely covered with a dark oxide layer	38.5 mg 31.8 g/m ² d	Completely covered with dark oxide layer	Oxide layer could not be completely removed. Light shiny under the layer	54.1 mg 16.0 g/m ² d

Group 1	Practically resistant	Weight loss of less than	2.4 g/m ² day
Group 2	Sufficiently resistant	Weight loss of	2.4-24 g/m ² day
Group 3a	Reasonably resistant	Weight loss of	24-72 g/m ² day
Group 3b	Little resistance	Weight loss of	72-240 g/m ² day
Group 4	Not resistant	Weight loss of more than	240 g/m ² day

Table 7