

FIG 1

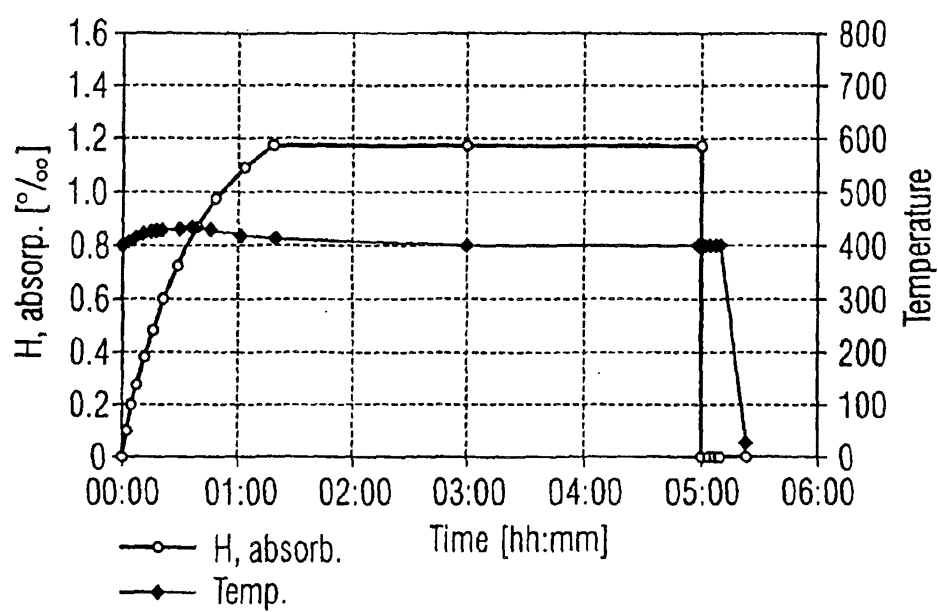


FIG 2

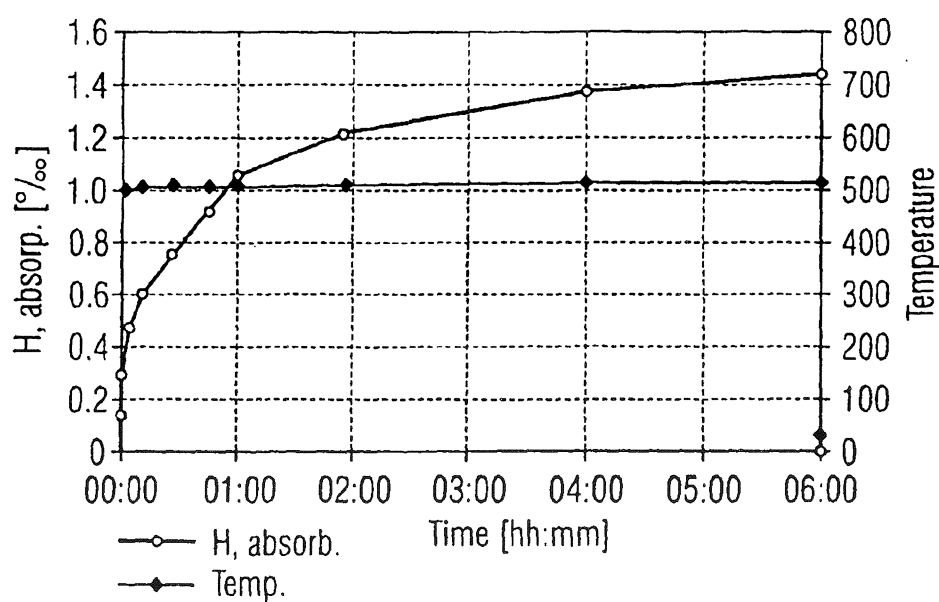


FIG 3

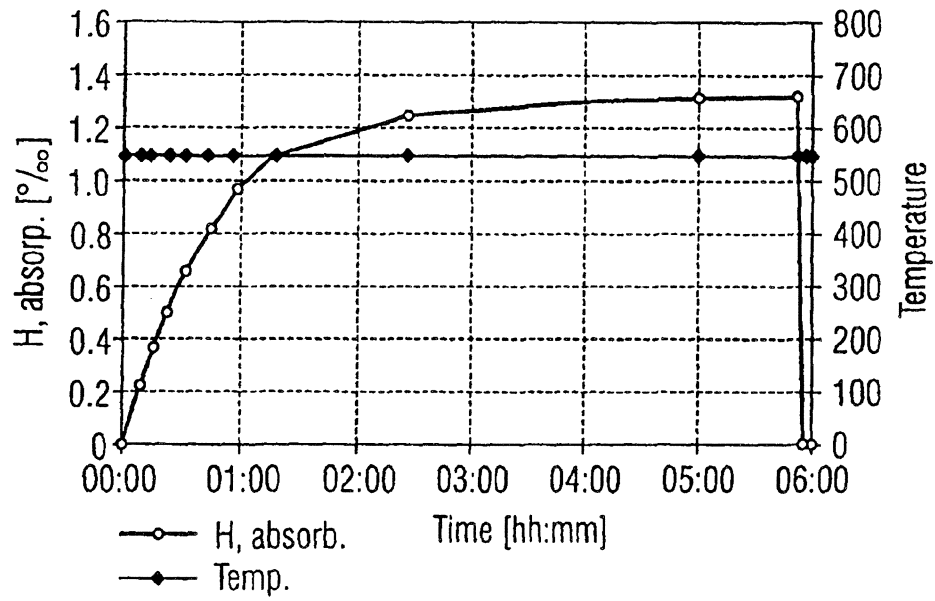


FIG 4

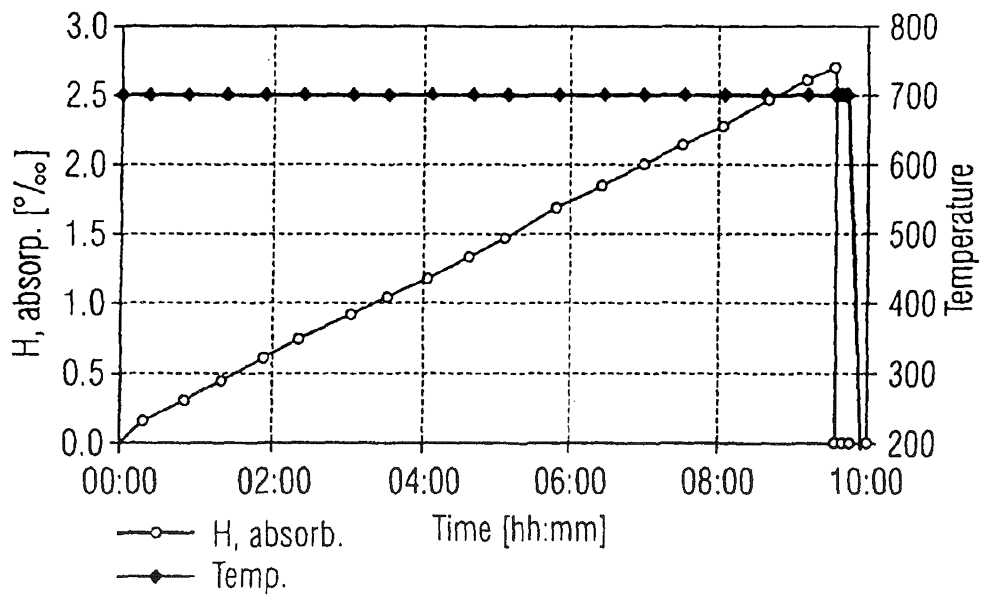


FIG 5

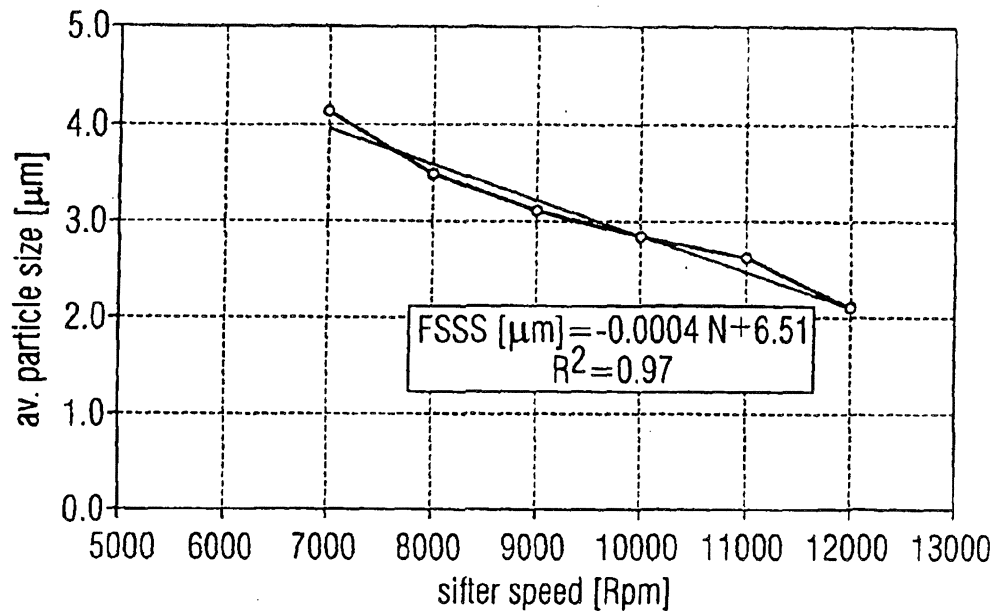
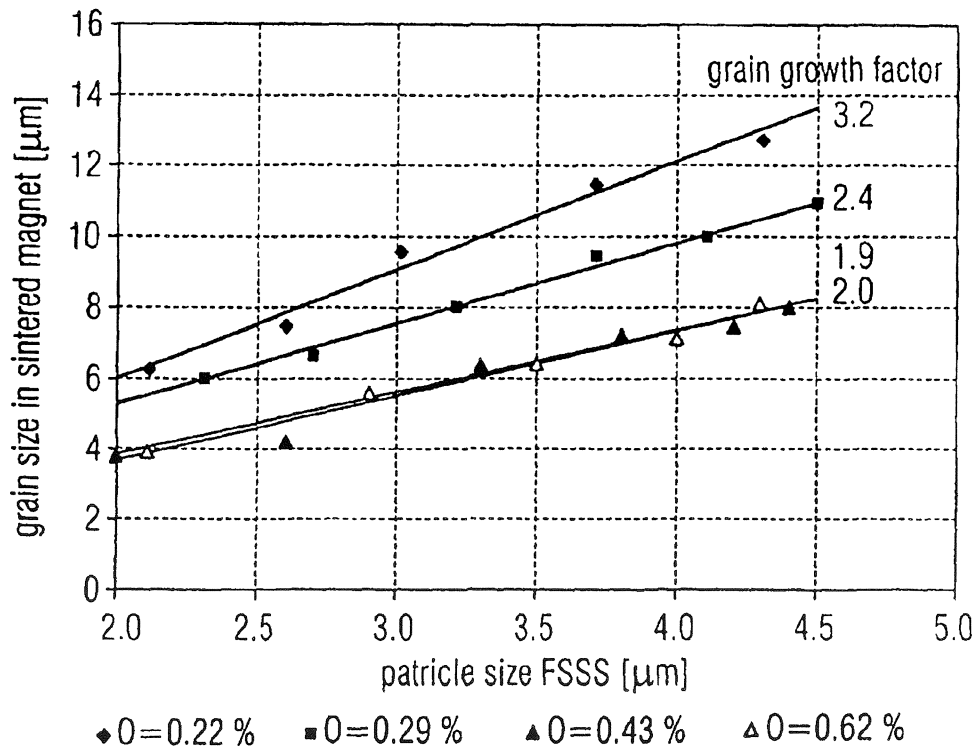


FIG 7



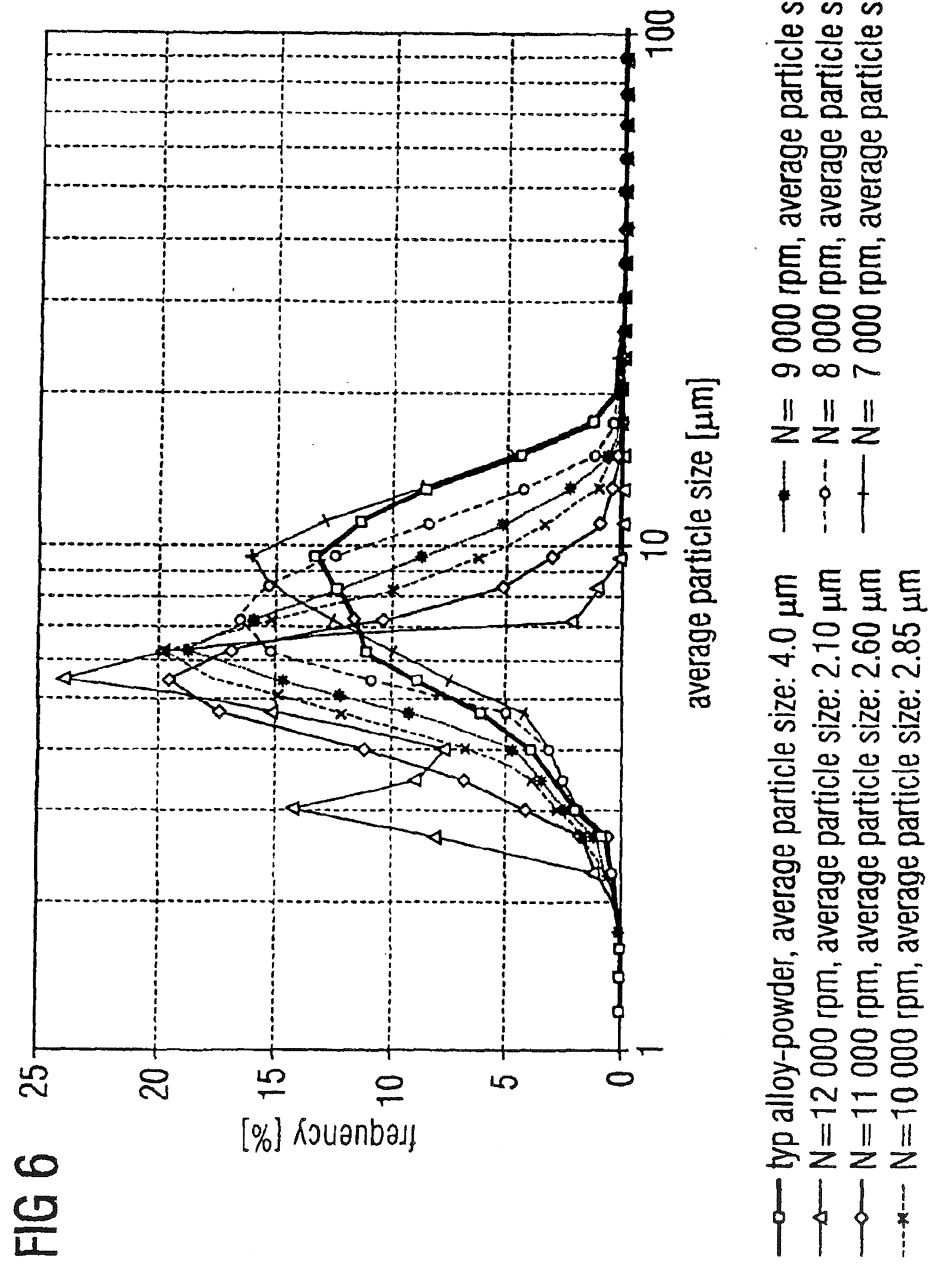
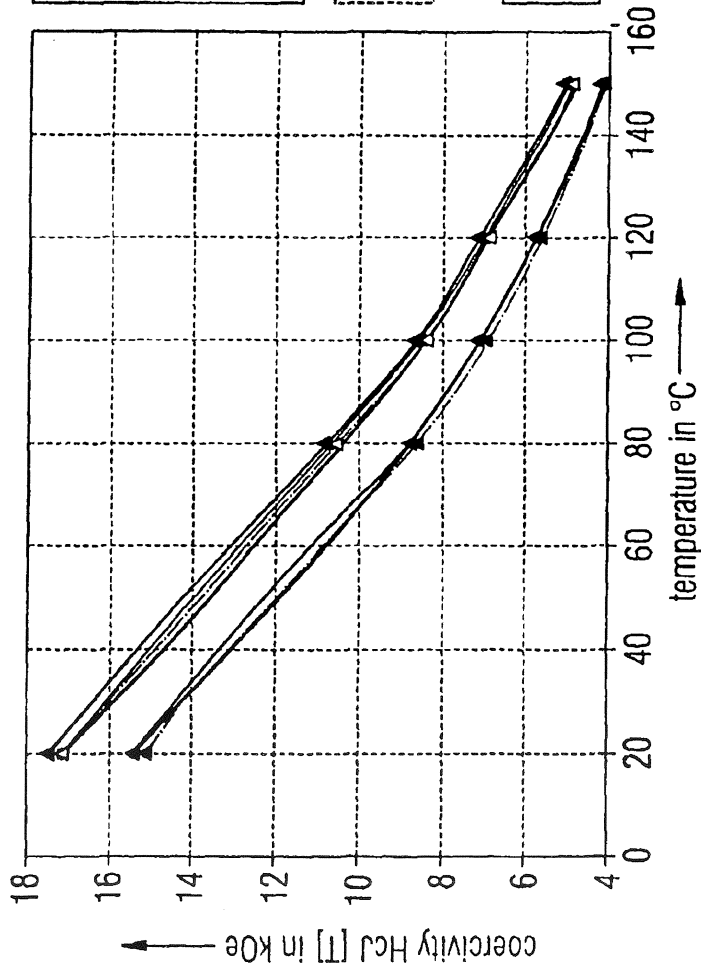


FIG 8



- ▲— 1080°C/4h PK, 480°C/1h PK, powder part. size: 4.1 μm
- △— 1080°C/4h PK, 480°C/1h PK, powder part. size: 2.6 μm
- ▲— 1070°C/4h PK, 480°C/1h PK, powder part. size: 4.1 μm
- ▲— 1070°C/4h PK, 480°C/1h PK, powder part. size: 2.6 μm
- 1070°C/4h PK, 480°C/1h PK, powder part. size: 2.6 μm

TC (H_{cJ}) 20-100 $^{\circ}\text{C}$
 -0.679/-0.670 %K, powder part. size: 4.1 μm
 -0.631/-0.629 %K, powder part. size: 2.6 μm

TC (H_{cJ}) 20-150 $^{\circ}\text{C}$
 -0.567/-0.564 %K, powder part. size: 4.1 μm
 -0.552/-0.550 %K, powder part. size: 2.6 μm

$H_{cJ}(T) = 0.0003 T^2 - 0.1388 T + 19.706$
 $R^2 = 1$, powder part. size: 2.6 μm

$H_{cJ}(T) = 0.0003 T^2 - 0.1414 T + 18.015$
 $R^2 = 1$, powder part. size: 4.1 μm

FIG 9

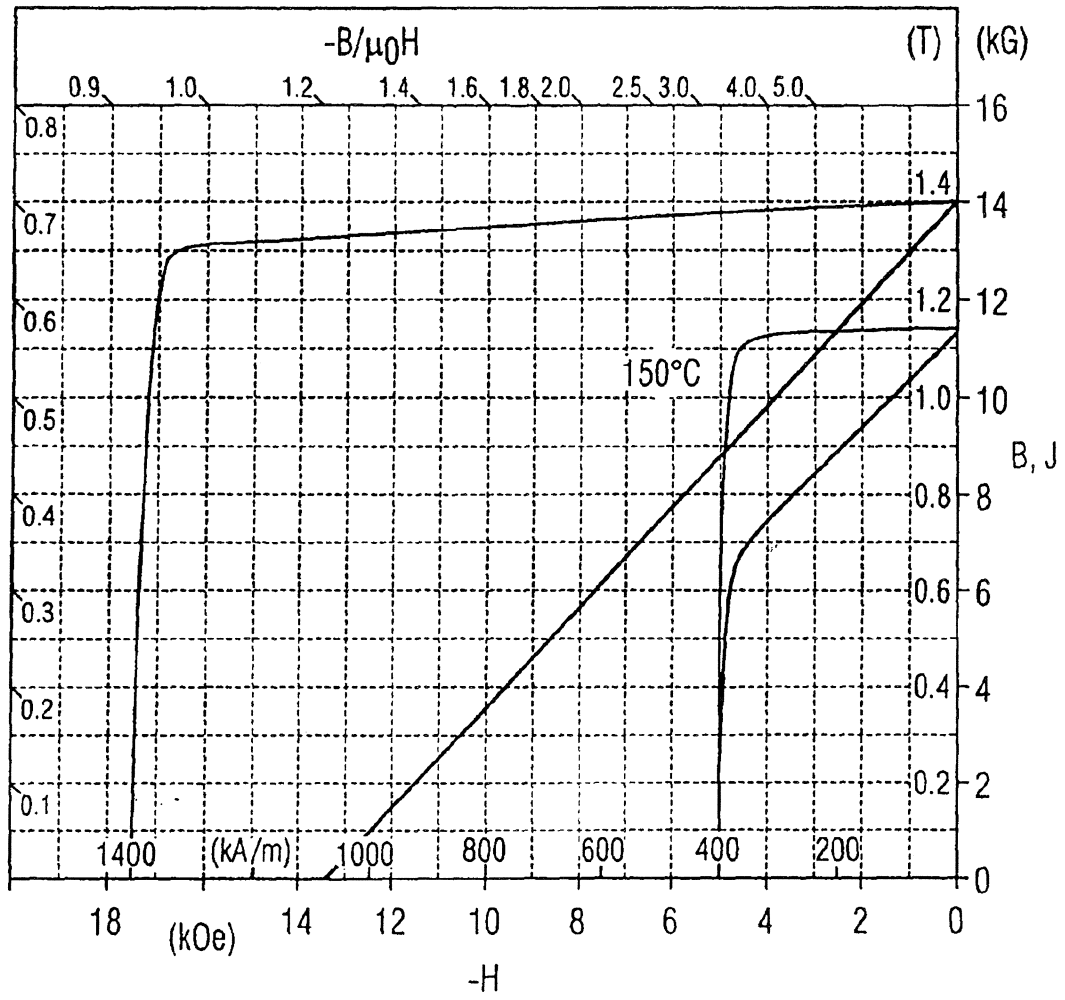
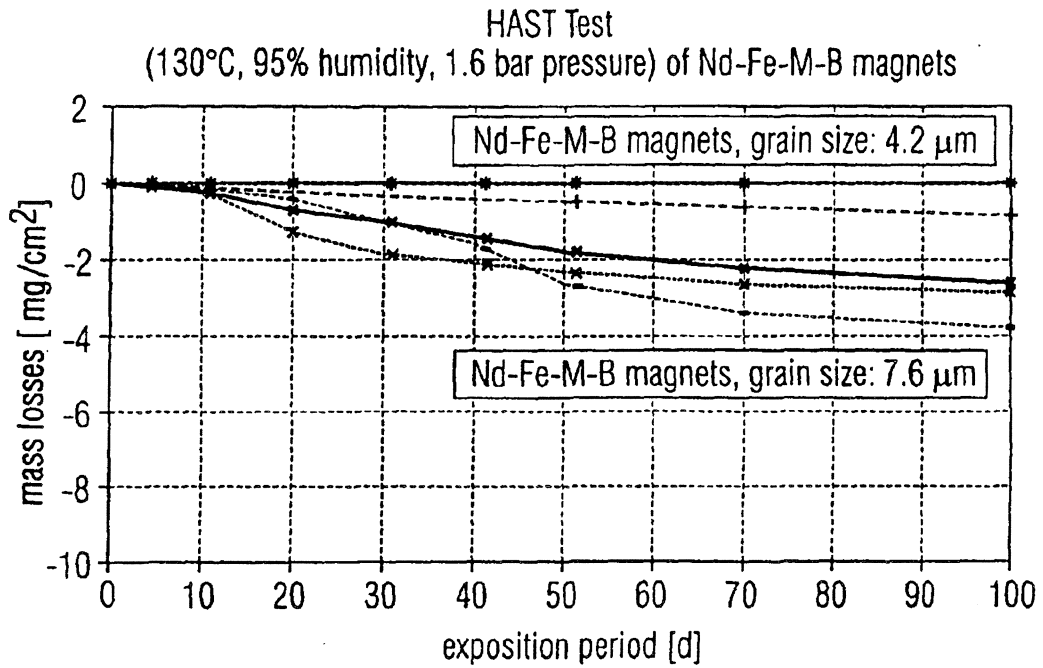
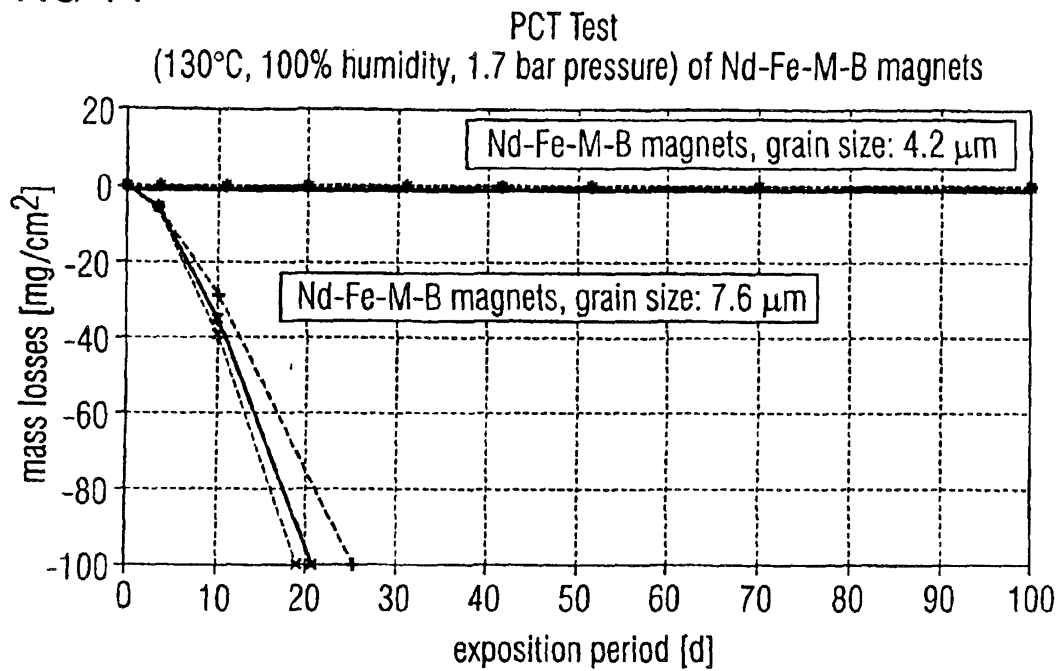


FIG 10



- | | |
|----------------------------------|----------------------------------|
| —*— Nr. 1, 4.1 μm | —+— Nr. 5, 4.1 μm |
| —•— Nr. 4, 4.1 μm | ---+--- Nr. 2, 7.6 μm |
| ---+--- Nr. 1, 7.6 μm | —•— Nr. 3, 4.1 μm |
| —*— MW | ---•--- MW |
| —•— Nr. 2, 4.1 μm | ---*--- Nr. 3, 7.6 μm |

FIG 11



- | | |
|-----------------------|-----------------------|
| —x— Nr. 1, 4.1 µm | — Nr. 5, 4.1 µm |
| — Nr. 4, 4.1 µm | ---•--- Nr. 2, 7.6 µm |
| ---+--- Nr. 1, 7.6 µm | —*— Nr. 3, 4.1 µm |
| — MW | MW |
| —+— Nr. 2, 4.1 µm | ---x--- Nr. 3, 7.6 µm |

Table 1

Sample	Hydrogenation Conditions					Results				
	T	p, H ₂	t, max	t, knee	Δm	ΔV from m	ΔV from p	ΔV/Δt, max, m	ΔV/Δt, max, p	
	(°C)	(bar)	(h)	(h)	(%)	(l/kg)	(l/kg)	(l/kg)	(l/kg)	
	450 - 500	0.3	3.5		0					
RS 1106 a	500	0.8	3	0.88	0.058	6.4	11.3	7.3	12.9	
RS 1106 b	500	1	6	2.44	0.089	9.8	11.7	4	4.8	
RS 1106 c	550	1	6	1.27	0.121	13.3	13	10.5	10.2	
RS 1116 f	400	1	5	0.56	0.056	6.2	20.5	11	36.6	
RS 1116 i	400	1	7.43	3.02	0.117	12.9	17.5	4.3	5.8	
RS 1116 h	450	1	6	1.39	0.111	12.2	19.5	8.8	14	
RS 1116 a	450 - 550	0.3	3.76	3.76	0.03	3.3	4.5	0.88	1.2	
RS 1116 d	500	0.6	6	4.46	0.119	13.1	16.5	2.9	3.7	
RS 1116 b	500	0.8	3.5	1.51	0.099	10.9	14	7.2	9.3	
RS 1116 m	500	1	6	1.66	0.66		16		9.6	
RS 1116 n, at 300°C to air	500	1	6	2.27	0.18		17.5		7.7	
RS 1116 o, at 200°C to air	500	1	6	2.49	0.114	12.5	19.7	5	7.9	
RS 1116 p, at 100°C to air	500	1	6	1.1	0.115	12.7	19.5	11.5	17.7	
RS 1116 c	500	1	6	0.68	0.097	10.7	18	15.7	26.9	
RS 1116 k, 5-10 mm	500	1	6	0.0119	0.144	15.8	18.2	1326	1524	
RS 1116 o, 1-2 mm	550	1	6	0.0669	0.14	15.4	14.4	230	216	
RS 1116 l, 1-2 mm	550	1	6	0.85	0.132	14.5	16	17.1	18.8	
RS 1116 g	600	1	6	4.15	0.205	22.6	20	5.4	4.8	
RS 1116 e	700	1	9.59	9.59	0.27	29.7	33.5	3.1	3.5	
RS 1116 j	450 - 500	0.3	3.61	3.61	0.023	2.5	3.5	0.7	0.97	
RS 1117 a	500	0.8	2.78	2.39	0.092	10.1	13.8	4.2	5.8	
RS 1117 b	500	1	6	2.34	0.111	12.2	15	5.2	6.4	
RS 1117 c	550	1	6	1.46	0.109	12	13.7	8.2	9.4	
RS 1117 g	450	0.5 - 1.5	3	0.012	0.082		11.1		1520	
74/1273	500	1	6	1.41	0.076	7.3	13.4	5.1	9.5	
74/5980 c	500	1	6	1.51	0.079	8.7	13.3	5.8	8.8	
74/5984 c	500	1	6	1.32	0.074	8.1	11.7	6.2	8.9	
74/6004 c	500	1	6	1.51	0.097	10.2	14.3	6.8	9.4	
74/5895 c	500	1	6							

Table 2

Sample	Hydrogenation Conditions			time (d)	500 μ m (%)
	T (°C)	p, H ₂ (bar)	t, max (h)		
RS 1106 a	450-550	0.3	3.5	197	0.45
RS 1106 b	500	0.8	3	174	5.67
RS 1106 c	500	1	6	155	0.36
RS 1106 g	550	1	6	154	0.50
RS 1116 t	400	1	5	88	16.4
RS 1116 f +300°C/2h/air				59	92.3
RS 1116 i	400	1	7.43	53	1.40
RS 1116 h	450	1	6	85	4.03
RS 1116 a	450-550	0.3	3.76	88	0.48
RS 1116 d	500	0.6	6	63	3.03
RS 1116 b	500	0.8	3.5	70	0.38
RS 1116 m, at 300°C to air	500	1	6	107	99.82
RS 1116 n, at 200°C to air	500	1	6	106	0.88
RS 1116 p, at 100°C to air	500	1	6	99	0.56
RS 1116 c	500	1	6	64	1.66
RS 1116 c +300°C/2h/air				59	86.6
RS 1116 k, 5-10 mm	500	1	6	44	1.63
RS 1116 o, 1-2 mm	500	1	6	101	4.74
RS 1116 l, 1-2 mm	550	1	6	39	5.22
RS 1116 g	550	1	6	86	3.64
RS 1116 e	600	1	6	88	3.33
RS 1116 e +300°C/2h/air				59	2.07
RS 1116 j	700	1	9.59	77	0.70
RS 1117 a	450-550	0.3	3.61	189	0.67
RS 1117 b	500	0.8	2.78	170	0.61
RS 1117 c	500	1	6	152	2.87
RS 1117 g	550	1	6	73	2.59
74/5980 c	500	1	6	133	3.42
74/5984 c	500	1	6	140	33.56
74/6004 c	500	1	6	132	0.53
74/5895 c	500	1	6	64	2.65
RS 1108/09, 10 mm	530-600	1	3	78	1.28
RS 1107, 20 mm	530-600	1	3	78	4.71
RS 1119, at 100°C to air	600	1	6	143	1.47
RS 1127, at 70°C to air	550	1	5	52	0.18
RS 1128, at 70°C to air	550	1	5	52	0.81
RS 1129, at 70°C to air	550	1	5	52	0.46
RS 1130, at 70°C to air	550	1	5	52	0.52

Table 3

Sample	time (day)	mean diameter (cm)	fraction <500 μ m (%)	Impurity pick up for a 2.5cm cube after 100 days		
				Cx (%)	Ox (%)	Nx (%)
RS 1127, at 70°C to air, HD=550°C	52	2.0	0.18	0.001	0.086	-0.012
RS 1128, at 70°C to air, HD=550°C	52	2.0	0.81	0.004	0.098	-0.005
RS 1116p, at 100°C to air, HD=500°C	99	2.5	0.56	0.009	0.102	-0.007
RS 1116n, at 200°C to air, HD=500°C	106	2.5	0.88	-0.007	0.250	0.002
RS 1116m, at 300°C to air, HD=500°C	107	2.5	99.80	0.033	1.396	0.132
RS 1116c+300°C/2h/air, HD=500°C	59	2.5	86.60	0.025	2.054	0.021
RS 1116 e+300°C/2h/air, HD=600°C	59	2.5	2.07	0.040	0.403	0.043

Table 4

Alloy	Ni layer thickness	Total surface damage	Surface damage of base material	Average grain size KG
	e [μ m]	g [μ m]	[μ m]	[μ m]
Nd-Fe-M-B Magnet KG ca.9 μ m	12.4	17.0	10.8	7 - 11
	12.4	16.5	10.3	
	12.4	14.0	7.8	
Nd-Fe-M-B Magnet KG ca.4,2 μ m	12.6	10.6	4.3	4.0 - 4.4
	12.6	10.6	4.3	
	12.6	10.4	4.1	
Nd-Fe-M-B Magnet KG ca.4,2 μ m	16.3	10.5	2.3	4.0 - 4.4
	16.3	11.1	2.9	
	16.3	10.5	2.3	