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**METHOD OF OBTAINING POLYMERS OF EPOXYBISPHENOL A RESINS**

by

A.V. Bondarenko, F.I. Kukoz, et al.



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METHOD OF OBTAINING POLYMERS OF EPOXYBISPHENOL A RESINS

By: A.V. Bondarenko, F.I. Kukoz, et al.

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Block	Italic	Transliteration	Block	Italic	Transliteration
А а	<i>А а</i>	A, a	Р р	<i>Р р</i>	R, r
Б б	<i>Б б</i>	B, b	С с	<i>С с</i>	S, s
В в	<i>В в</i>	V, v	Т т	<i>Т т</i>	T, t
Г г	<i>Г г</i>	G, g	У у	<i>У у</i>	U, u
Д д	<i>Д д</i>	D, d	Ф ф	<i>Ф ф</i>	F, f
Е е	<i>Е е</i>	Ye, ye; E, e <sup>a</sup>	Х х	<i>Х х</i>	Kh, kh
Ж ж	<i>Ж ж</i>	Zh, zh	Ц ц	<i>Ц ц</i>	Ts, ts
З з	<i>З з</i>	Z, z	Ч ч	<i>Ч ч</i>	Ch, ch
И и	<i>И и</i>	I, i	Ш ш	<i>Ш ш</i>	Sh, sh
Й й	<i>Й й</i>	Y, y	Щ щ	<i>Щ щ</i>	Shch, shch
К к	<i>К к</i>	K, k	Ь ь	<i>Ь ь</i>	"
Л л	<i>Л л</i>	L, l	Ы ы	<i>Ы ы</i>	Y, y
М м	<i>М м</i>	M, m	Ь ь	<i>Ь ь</i>	'
Н н	<i>Н н</i>	N, n	Э э	<i>Э э</i>	E, e
О о	<i>О о</i>	O, o	Ю ю	<i>Ю ю</i>	Yu, yu
П п	<i>П п</i>	P, p	Я я	<i>Я я</i>	Ya, ya

<sup>a</sup>ye initially, after vowels, and after ъ, ь; e elsewhere.  
When written as ѣ in Russian, transliterate as yě or ǎ.

RUSSIAN AND ENGLISH TRIGONOMETRIC FUNCTIONS

Russian	English	Russian	English	Russian	English
sin	sin	sh	sinh	arc sh	sinh <sup>-1</sup>
cos	cos	ch	cosh	arc ch	cosh <sup>-1</sup>
tg	tan	th	tanh	arc th	tanh <sup>-1</sup>
ctg	cot	cth	coth	arc cth	coth <sup>-1</sup>
sec	sec	sch	sech	arc sch	sech <sup>-1</sup>
cosec	csc	csch	csch	arc csch	csch <sup>-1</sup>

Russian	English
rot	curl
lg	log

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## METHOD OF OBTAINING POLYMERS OF EPOXYBISPHENOL A RESINS

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V. A. Lyutsedarskiy, V. I. Kulinich and Yu. M. Volosyuk

476297

Invention relates to obtaining crystalline polymers of epoxybisphenol A resins, which can be used in production of permanent magnets from powder materials, and also in other areas of technology, where epoxies with higher physicomechanical properties are required.

Is known the method of obtaining polymers of epoxybisphenol A resins by solidification during the heating in the magnetic field of the composition, which contains resin, hardener, and, as the filler, extended particles of iron. Polymers obtained in this case have amorphous structure.

It is known that crystalline polymers exceed amorphous ones in their technical characteristics.

Purpose of invention - to increase the physicomechanical properties of polymers of epoxybisphenol A resins by creation in the polymers of crystal structure.

According to invention, as the filler of epoxybisphenol A resins are used fiberlike particles of ferromagnet, for example iron, in quantity 20-30% of the weight of composition. The further prepared composition is subjected to the effect of magnetic field with strength of 7000-8000 Oe and to heating to a temperature of 180-220°C, at which the composition is maintained at a pressure of 150-200 atm. with subsequent cooling.

Example. Obtaining the polymer of epoxybisphenol A resin ED-5.

Into epoxybisphenol A resin ED-5 add 30% (by weight) of fiberlike particles of iron with thickness of each about 150-400 Å and with length  $10^5$  Å. Mix mixture, place into the mold, located between the poles of electromagnet, then is created magnetic field with strength to 8000 Oe. Further is heated to temperature of 200°C during 40 min, maintained at this temperature 20 min, raising pressure on the sample to 200 atm. Under these conditions the sample is cooled to room temperature. In the obtained sample epoxybisphenol A resin, as show X-ray investigations and IR-spectroscopy, hardens in crystalline state. The articles, manufactured according to the proposed method, possess the best physicomechanical properties in comparison with the properties of noncrystalline

polymer. Samples extract themselves good from the mold, do not break and do not crumble, while the samples, obtained by known method, peel off and shear off.

The characteristic of samples is given in the table.

(1) Свойство	(2) Образцы	
	(3) кристал- лический	(4) некристал- лический
Динамическая вязкость, (5) кг·см/см <sup>2</sup>	7	3
Микротвердость по Бри- (6) неллю, кг/мм <sup>2</sup>	450	122
Предел прочности, кг/см <sup>2</sup> : (7) при сжатии (8) на разрыв (9)	5900	1800
	835	643
Удельное объемное элек- (10) трическое сопротивление, ом·см	0.06	0.02
Плотность, г/см <sup>3</sup> (11)	1.5	1.5

Key: (1). Property. (2). Samples. (3). crystalline. (4). noncrystalline. (5). Dynamic viscosity, kg·cm/cm<sup>2</sup>. (6). Microhardness on Brinell, kg/mm<sup>2</sup>. (7). Limit of strength, kg/cm<sup>2</sup>. (8). during compression. (9). to break. (10). Specific volumetric electrical resistance, Ω·cm. (11). Density, g/cm<sup>3</sup>.

#### Object of invention

The method of obtaining the polymers of epoxybisphenol A resins by the effect of magnetic field and temperature on the composition of epoxy and dispersed ferromagnet, for example iron, is characterized by the fact that, for the purpose of an increase in the physicomachanical properties of polymers, ferromagnet is introduced into resin in the form of particles of fiberlike form in quantity of 20-30% of the weight of composition, the latter are subjected to the effect of magnetic field with strength of 7000-8000 Oe and to heating to a temperature of 180-220°C, at which the composition is maintained at a pressure of 150-200 atm. with subsequent cooling.

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