

B₂O₃.

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New semiconductor varistor tin dioxide based ceramics with the addition of B₂O₃ and without bismuth oxide was studied. It is shown, what optimal concentration of the boron oxide for maximal nonlinearity of current-voltage characteristics is 0,3-0,7 mol. %. The nonlinearity coefficient in this case is 45-55 and these values are comparable with nonlinearity of the ZnO based industrial varistors.

Keywords: dioxide of tin, varistor, ceramics, non-linearity, semiconductor, not ohm conductivity.

() ()
 - () [1-3].
 : I - , U - , B -

$$I = BU^S \tag{1}$$

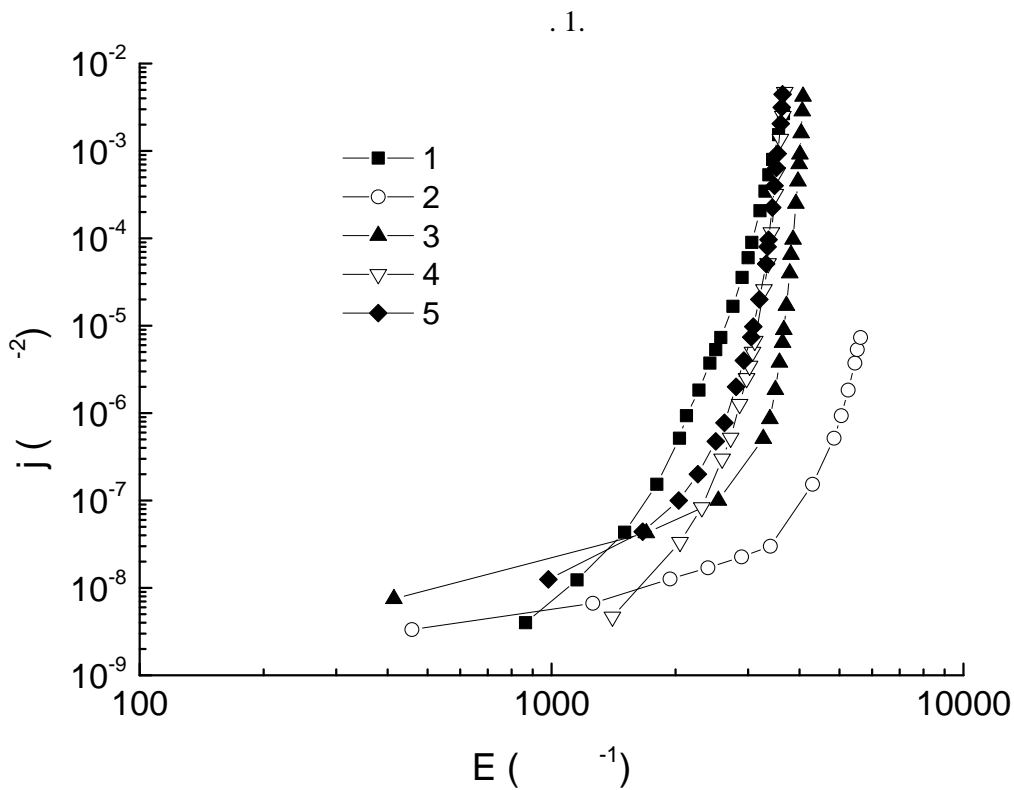
$$S = \frac{R_s}{R_d} = \frac{U}{I} \frac{dI}{dU} \approx \frac{\Delta \lg I}{\Delta \lg U} \tag{2}$$

ZnO

40-60.

E_1
1 MA CM⁻¹.
 ZnO [4]
 Bi₂O₃, Co₃O₄, BaO, Sb₂O₅. = 21
 (E₁ 3500 ⁻¹).
 Co₃O₄,
 [5-7] = 41.
 Nb₂O₅ Cr₂O₃, 50,
 [8] Bi₂O₃ B₂O₃ - 70-75
 [9], (E₁ 5000 ⁻¹).
 E₁, 142 [10],
 [11; 12].
 () [13].

[14], Bi_2O_3 , Bi_2O_3 , SnO_2 - Bi_2O_3 , Co_3O_4 - Nb_2O_5 - Cr_2O_3 , B_2O_3 , 60, 1520, 10, 1, 350, E , 1, $\tau = \tau_0 \exp\left(-\frac{E_{\tau}}{kT}\right)$, (3)



1. SnO_2 - Co_3O_4 - Nb_2O_5 - Cr_2O_3 2 - 0,1 %, 3 - 0,3 %, 4 - 0,5 %, 5 - 0,7 %, B_2O_3 (1) : %

1. , , -
 B_2O_3 19. 0,1 . % B_2O_3 -
 $E_1 > 5500$ -
 0,3-0,7 . % -
 45-55, -
 4000-3500 B_2O_3 (. 1). -
 , 0,7 . % -
 [15], -
 [4]. -
 Nb^{5+}, Sb^{5+}, V^{5+} [16]. -

1. $SnO_2-Co_3O_4-Nb_2O_5-Cr_2O_3$ -
 B_2O_3

B_2O_3 , . %	,	E_1 (10^{-3} $^{-1}$ $^{-2}$),	, E ()
	19	3500	1,2
0,1	20	>5600	1,2
0,3	52	4015	1,1
0,5	48	3550	1,1
0,7	47	3550	1,1

SnO_2 , -
 [12].
 B_2O_3 . ,
 (740), -
 B_2O_3 -
 E . n -
 ([17]), E 0,1-0,2 ,
 0,3-0,7 . % . [13], -
 d^0/dU , -
 ([18]), [11], -
 , 0,7 . % -
 B_2O_3 , -

1. -

2. , - (=
45-55) B_2O_3 0,3-0,7 . % .
4000 $^{-1}$). ($E_f = 3500-$
3. B_2O_3)

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