

PCT

WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : B32B 9/00, C30B 23/00		A1	(11) International Publication Number: WO 99/42282
			(43) International Publication Date: 26 August 1999 (26.08.99)
(21) International Application Number: PCT/US99/01025 (22) International Filing Date: 19 January 1999 (19.01.99) (30) Priority Data: 09/026,946 20 February 1998 (20.02.98) US (71) Applicant: ADVANCED TECHNOLOGY MATERIALS, INC. [US/US]; 7 Commerce Drive, Danbury, CT 06810 (US). (72) Inventors: ROEDER, Jeffrey, R.; 4 Longmeadow Hill Road, Brookfield, CT 06804 (US). CHEN, Ing-Shin; Apartment A, 227 Danbury Road, New Milford, CT 06776 (US). BILODEAU, Steven; 20 Carriage Drive, Oxford, CT 06478 (US). BAUM, Thomas, H.; 2 Handol Lane, Danbury, CT 06812 (US). (74) Agent: HULTQUIST, Steven, J.; Intellectual Property/Technology Law, P.O. Box 14329, Research Triangle Park, NC 27709 (US).		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published With international search report.	

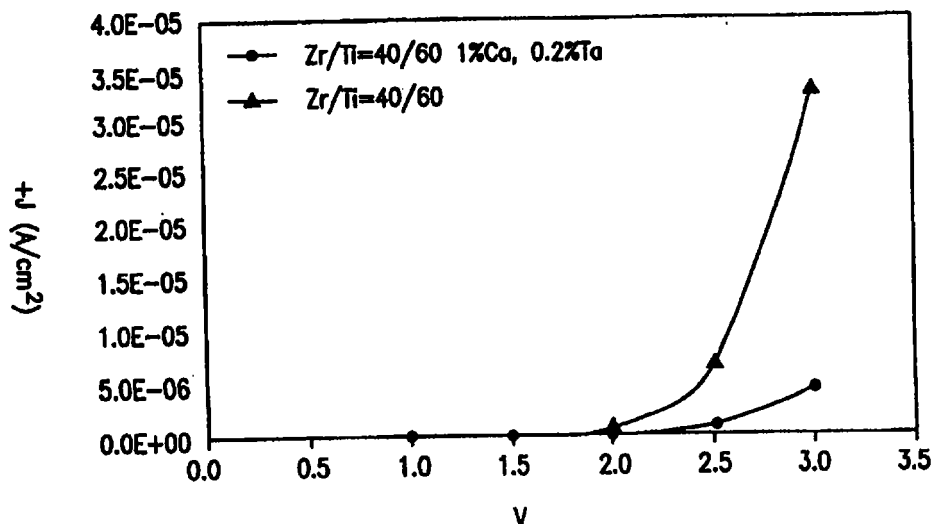


162162

000000



000000

(54) Title: A-SITE AND/OR B-SITE MODIFIED PBZRTIO₃ MATERIALS AND FILMS

(57) Abstract

A modified PbZrTiO₃ perovskite crystal material thin film, wherein the PbZrTiO₃ perovskite crystal material includes crystal lattice A-sites and B-sites at least one of which is modified by the presence of a substituent selected from the group consisting of (i) A-site substituents consisting of Sr, Ca, Ba and Mg, and (ii) B-site substituents selected from the group consisting of Nb and Ta. The perovskite crystal thin film material may be formed by liquid delivery MOCVD from metalorganic precursors of the metal components of the thin film, to form PZT and PSZT, and other piezoelectric and ferroelectric thin film materials. The thin films of the invention have utility in non-volatile ferroelectric memory devices (NV-FeRAMs), and in microelectromechanical systems (MEMS) as sensor and/or actuator elements, e.g., high speed digital system actuators requiring low input power levels.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece	ML	Mali	TR	Turkey
BG	Bulgaria	HU	Hungary	MN	Mongolia	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MR	Mauritania	UA	Ukraine
BR	Brazil	IL	Israel	MW	Malawi	UG	Uganda
BY	Belarus	IS	Iceland	MX	Mexico	US	United States of America
CA	Canada	IT	Italy	NE	Niger	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NL	Netherlands	VN	Viet Nam
CG	Congo	KE	Kenya	NO	Norway	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NZ	New Zealand	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	PL	Poland		
CM	Cameroon	KR	Republic of Korea	PT	Portugal		
CN	China	KZ	Kazakistan	RO	Romania		
CU	Cuba	LC	Saint Lucia	RU	Russian Federation		
CZ	Czech Republic	LI	Liechtenstein	SD	Sudan		
DE	Germany	LK	Sri Lanka	SE	Sweden		
DK	Denmark	LR	Liberia	SG	Singapore		
EE	Estonia						