

Principal Researcher	Masayoshi Sadakata			Number of Reserchers	3	
Research Institution • Department • Title	Professor, School of Engineering, The University of Tokyo			Location of Institution	Bunkyo-ku	
Title of Project	Study on the Application and Mechanism of O ⁻ Anion in the Gas-Phase Produced from the Nano-Porous Material					
Abstract of Research Project	<p>We have studied the mechanism of the oxide anion (O⁻) production from the solid surface for many years. Especially, we have concentrated on YSZ, used in the field of a fuel cell. However, we found the new material, 12CaO · 7Al₂O₃(C12A7), which is possible to produce the large amount of O⁻. C12A7 is the kind of the ceramics and has the nano-size hole (4Å) in its crystal structure. C12A7 is synthesized by sintering the mixed CaO and Al₂O₃ and the cost of synthesis is extremely low.</p> <p>It was found that the high density flux of O⁻ in the gas-phase could be produced by applying the electric field over 600 V/cm. The O⁻ ion current is over 1 μA/cm², which is 1000 times larger than that in previous study. We can say that C12A7 is able to be utilized for the following fields.</p> <ol style="list-style-type: none"> 1) Removal of SO₂ and NO 2) Decomposition of VOC (volatile organic compound) 3) Deodorization 4) Sterilization 5) CVD process 6) Eching of electric materials 7) Decomposition of flons <p>In order to realize the application of C12A7 for above fields, we will study the possibility that the much higher density O⁻ can be produced under the conditions of much lower temperature.</p>					
References	<p>1) Q. X. Li, M. Nishioka, <u>M. Sadakata</u> et al., "High-intensity atomic oxygen radical anion emission from 12CaO 7Al₂O₃ crystal surface" Surface Science, 527, 100-112, 2003.</p> <p>2) Q. X. Li, M. Nishioka, <u>M. Sadakata</u> et al., "Absolute emission current density of O⁻ from 12CaO · 7Al₂O₃ crystal", Appl. Phys. Letts, 80, 4259-4261, 2003.</p>					
Term of Project	Fiscal years 2003-2007 . (5years)					
Budget Allocation (in thousand of yen)	FY2003	FY2004	FY2005	FY2006	FY2007	TOTAL
	26,500	165,00	11,900	11,900	11,500	78,300
Homepage Address	http://www.sada.t.u-tokyo.ac.jp/title.html					