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1	Dr. S. H. Jadhav	Book Chapter- 'Sulfosalicylic Acid Mediated Induction of PR- Proteins in Groundnut', pp. 225-230 in the book 'Research Interventions and Advancements in Plant Sciences'	Nil	Nil	Nil	National	2020	ISBN 978-93-88901-14-7	Krishna Mahavidyalaya, Rethare Bk.	Bhumi Publishing, Kolhapur
2	Mr. A. A. Thorat	Book Chapter-कागदाचा शोध आणि पुस्तक निर्मिती in the book-पुस्तक निर्मितीचा प्रवास: प्राचीन काळापासून हस्तलिखित ते ई बुक	Nil	Nil	Nil	National	2020	ISBN 978-93-89501-56-8	Krishna Mahavidyalaya, Rethare Bk.	Prashant Publication

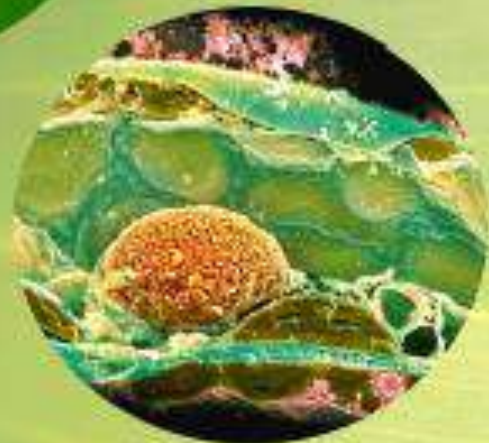
3	Dr. D. S. Dalavi, Mrs. R.S.Desai	Nil	Energy efficient electrochromic smart windows based on highly stable CeO ₂ -V ₂ O ₅ optically passive counter electrode	Materials Today: Proceedings	International Conference on Multifunctional and Hybrid Materials for Energy and Environment (MHMEE-2020) at YC Institute of Satara during 29-31 January 2020	International	2021	ISSN 22147853	Krishna Mahavidyalaya, Rethare Bk.	Elsevier
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22.	ARBUSCULAR MYCORRHIZAL BIO FERTILIZER: ITS PRODUCTION AND UTILIZATION FOR SUSTAINABLE AGRICULTURE OF MICROPROPAGATED BANANA PLANTLETS Prita Shamrao Borkar, Amol Rajeshwar Balegsonkar and Vidya Sedashivrao Paikrao	183 – 192
23.	ETHNOBOTANICAL DOCUMENTATION OF MEDICINAL PLANTS IN KAPPATAGUDDA FOREST OF GADAG DISTRICT IN KARNATAKA STATE, INDIA Spoorti D. H. and Rashmi S.	193 – 204
24.	UTILIZATION OF <i>EURYA ACUMINATA</i> DC. IN TRADITIONAL RECIPES BY THE HMAR TRIBE OF MANIPUR, NORTHEAST INDIA Ruth Laldinther	205 – 210
25.	IMPACT OF COMPLEX MEDIA ON PRODUCTION OF CELLOBIASE AND SUCRASE FROM FILAMENTOUS FUNGUS <i>TERMITOMYCES CLYPEATUS</i> Shakuntala Ghosei	211 – 218
26.	CHARACTERIZATION OF A LOCAL RAW HONEY SAMPLE AND ASSESSMENT OF ITS ANTIMICROBIAL ACTIVITY Soumi Guha Polley, Khusboo Jhunjhunwala and Mou Saha	219 – 224
27.	SULFOSALICYLIC ACID MEDIATED INDUCTION OF PR- PROTEINS IN GROUNDNUT Sunita H. Jadhav	225 – 230
28.	UBIQUITOUS PHYTOHORMONE ABSCISIC ACID IN PHYTOREMEDIATION AND BIOMEDICAL APPLICATIONS: AN OVERVIEW C. Sumathi Jones	231 – 242
29.	FLUORIDE INDUCED CHANGES IN ANTIOXIDATIVE ENZYMES OF MEDICINALLY IMPORTANT OIL YIELDING PLANT <i>SIMAROUBA GLAUCA</i> Varsha V. Mali and D. K. Gaikwad	243 – 248
30.	PHYTOCHEMICAL SCREENING AND ANTIMICROBIAL EFFICIENCY OF TWO MACROLIKEN SPECIES FROM KARNATAKA Vinayaka K. S	249 – 258
31.	STUDY OF DIVERSITY OF COPROPHILOUS FUNGI FROM SELECTED DUNG SAMPLE Priya Lokare and Sumia Fatima	259 – 266
32.	IMPACT OF MARINE POLLUTION ON SEA WEEDS- A THREAT TO MARINE BIODIVERSITY Nandita Singh, Mansha Ansari and Fatema Zohra Momin	267 – 274



SULFOSALICYLIC ACID MEDIATED INDUCTION OF PR- PROTEINS IN GROUNDNUT

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Abstract:

Salicylic acid (SA) is an important signalling molecule, it plays an important defensive role in plants against various biotic and abiotic stresses. 5-sulfosalicylic acid (SSA) is one of the derivative of Salicylic acid. Although SA and its related compounds are well known for inducing various physiological and biochemical processes in plants, little is known about effects of SSA. A field experiment was, therefore carried out to evaluate the possible involvement of antioxidative enzymes and lipid peroxidation in SSA mediated induction of pathogenesis related proteins (PR-protein) in groundnut. The results showed that all the concentrations of SSA increased lipid peroxidation, activities of peroxidase and superoxide dismutase. In particular, the treatment of 50 ppm SSA found better influence. In contrast to it the activity of enzyme catalase was decreased with all the applied concentrations of SSA. The protein profile revealed appearance of relatively prominent PR-protein bands in 5 and 50 ppm SSA treated plant leaves. The detected protein bands are generally belonging to the PR-1 and PR-5 families having chitinase and glucanase activity. The results pertinent to antioxidative enzymes and protein profile indicated that SSA mediated induction in lipid peroxidation could act as translocated signal that may elevate PR- protein induction and establish systemic acquired resistance (SAR) in groundnut.

Keywords: Antioxidative enzymes, Groundnut, PR-proteins, Sulfosalicylic acid, Systemic Acquired Resistance

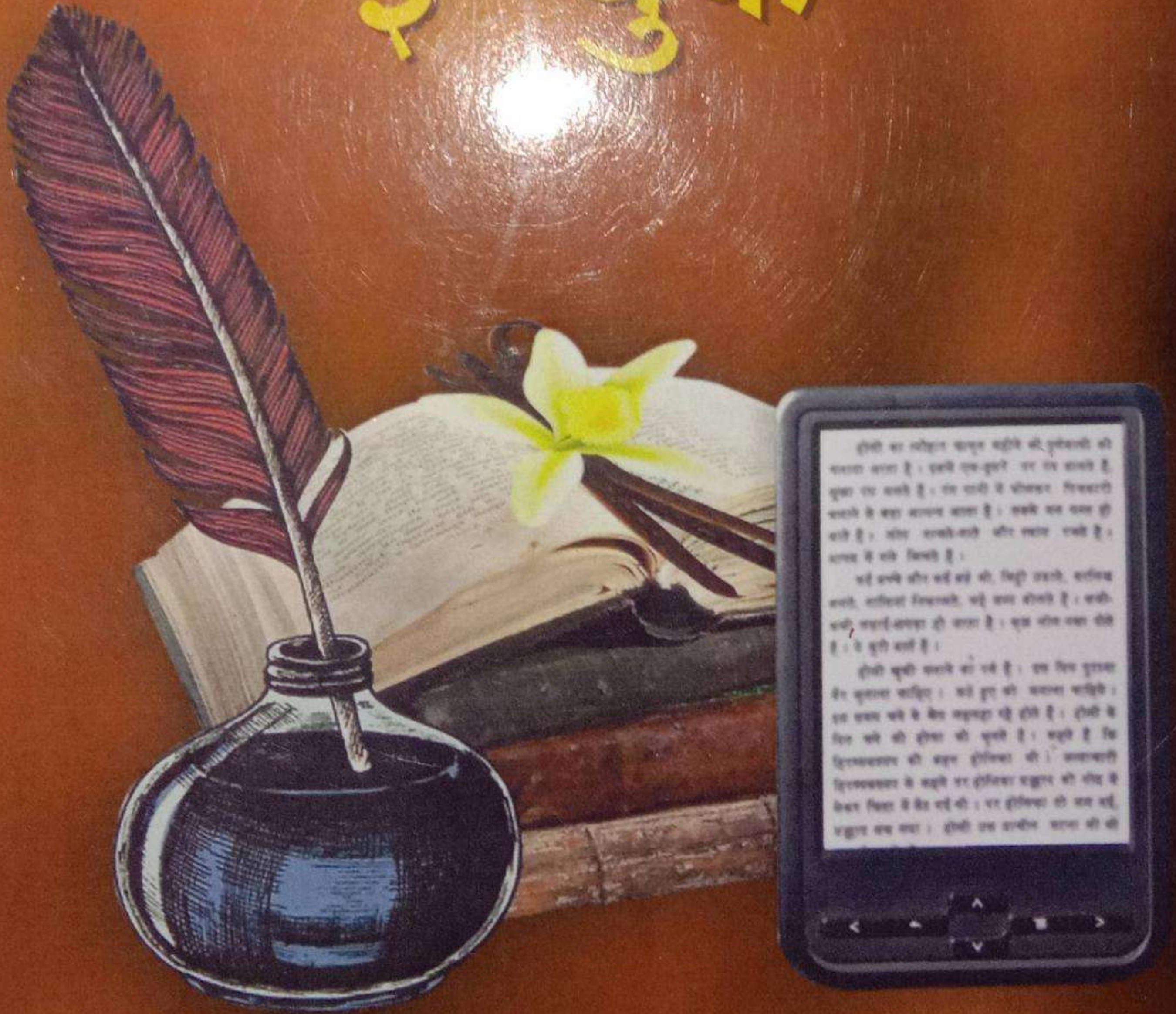
Introduction:

Salicylic acid (SA) is an important natural endogenous signal molecule (Raskin, 1992). It plays a major defensive role in plants against various biotic and abiotic stresses (Huang *et al.*,

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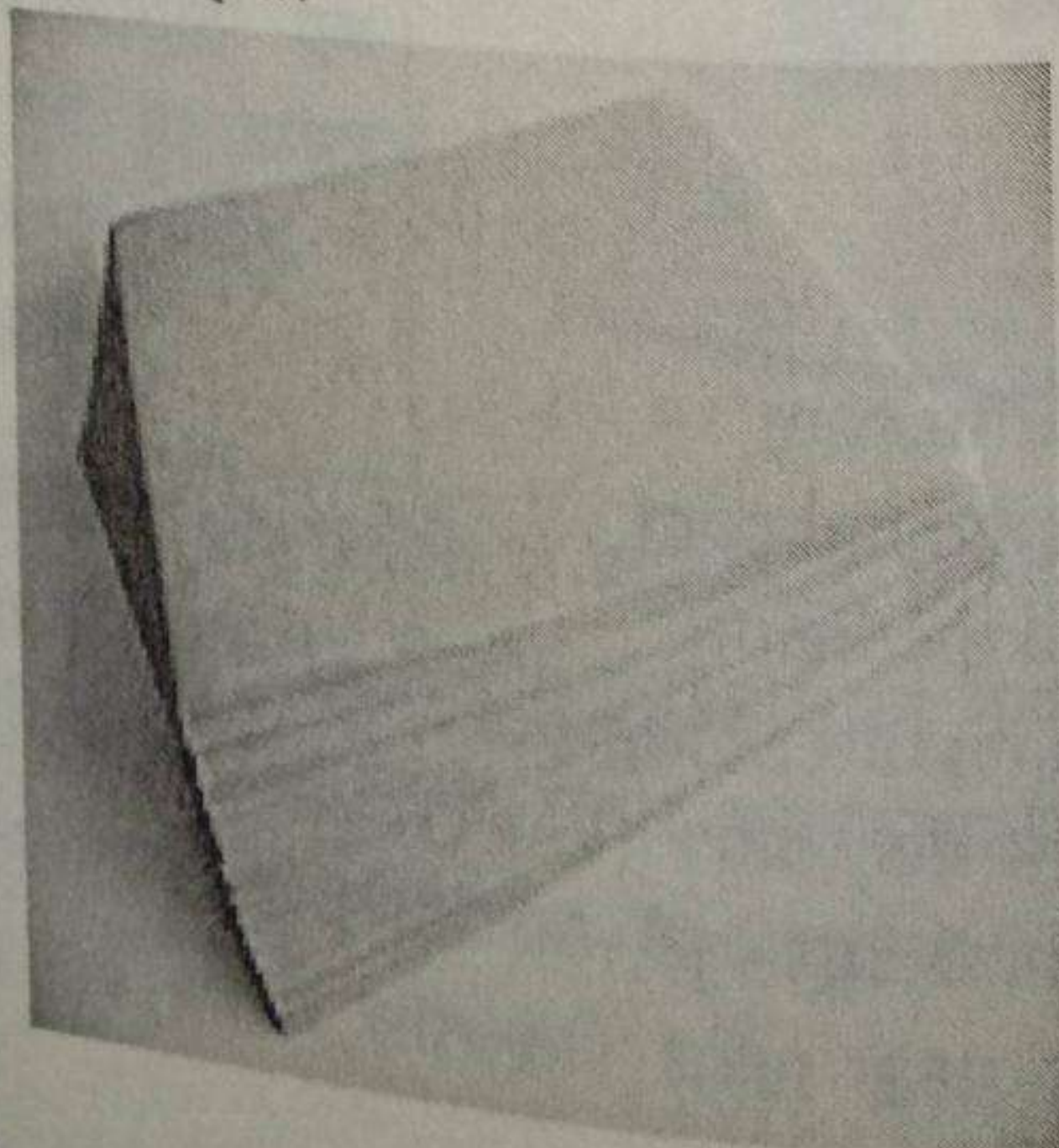
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- लिपीचा शोध : पुस्तक निर्मितीच्या प्रवासातील महत्वाचा टप्पा १३
- हितेश ब्रिजवासी, डॉ. प्रकाश विजय बर्वे
- प्राचीन काळातील लेखन साहित्य आणि पध्दती २१
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- लेखन पध्दतींचा प्राचीन इतिहास ३८
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- लेखन कलेचा उगम ४४
- डॉ. राजकुमार पंढरीनाथ घुले
- शोध छपाई तंत्राचा ४८
- डॉ. बी. ए. पाटील
- पुस्तक निर्मितीची नवी दिशा : छपाई तंत्रज्ञान ५२
- हेमंत एकनाथ बुधावले
- ✓ ■ कागदाचा शोध आणि पुस्तक निर्मिती ६०
- अमोल अरुण थोरात
- पुस्तक निर्मितीत कागदाचा उपयोग ६५
- किशोर रामदास माळी
- पुस्तक निर्मितीचा प्रवास ६९
- शुभांगी योगेश अकोटकर
- पुस्तक निर्मितीची प्रक्रिया : एक अभ्यास ७३
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कागद हे आपल्या रोजच्या जीवनाचे एक अविभाज्य अंग बनलेले आहे. मानवाच्या आयुष्यात अन्न, वस्त्र, निवारा इतकेच महत्त्व कागदाला प्राप्त झाले आहे. कागदाचा शोध लागल्यापासून व त्याचा वापर सुरु झाल्यापासून आज आपण कागदाशिवाय जगायची कल्पनाही करू शकत नाही. आपला दिवस सुरु होतो तोच वृत्तपत्राच्या म्हणजेच कागदाच्या माध्यमातून, आज शासकीय व अशासकीय कोणत्याही कार्यालयात गेले कि तेथे सर्व प्रथम आपल्याला आपले ओळखपत्र विचारले जाते. कुठेही सार्वजनिक वाहतुकीने बस, रेल्वे, विमान, जहाज आणि प्रवास करणे असो, चित्रपट, नाटक, सर्कस पाहणे असो संग्रहालय अशा ठिकाणी प्रवेशासाठी शुल्क असते. त्या ठिकाणी तिकिट असा उच्चार केला जातो. तो साधारणपणे कागदाचा एक तुकडा असतो. आपले जन्म, मृत्यु, शैक्षणिक पात्रता, जमिनीचे व बँकेचे व्यवहार, पुस्तके, वह्या, पत्र व्यवहार करण्यासाठी आपण कागदाचा वापर करतो. याशिवाय जीवनाच्या अनेक क्षेत्रात कागदाने प्रवेश केला आहे. तुकोबारायांनी देवा बदल असे म्हंटले आहे कि, जेथे जातो तेथे तू माझा सांगाती. आज कागदाबाबत आपण हेच म्हणू शकतो. पण मुळात कागद म्हणजे काय? कागदाचा शोध कोणी व का लावला? त्याचा इतिहास काय? कागद कसा तयार होतो? व कागदापासून पुस्तकाची निर्मिती कशा प्रकारे केली जाते याचा आपण सविस्तर शोध घेणार आहोत.





Energy efficient electrochromic smart windows based on highly stable $\text{CeO}_2\text{-V}_2\text{O}_5$ optically passive counter electrode

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ABSTRACT

The $\text{CeO}_2\text{-V}_2\text{O}_5$ mixed oxides thin films have been deposited by spray pyrolysis technique (SPT) onto a glass and fluorine doped tin oxide (FTO) coated glass substrates. The precursor solution containing cerium nitrate hexahydrate [$\text{Ce}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$] and vanadium trichloride (VCl_3) having different volumetric proportions (0–5 vol% of Vanadium) in methanol. These films were characterized for their structural, morphological, compositional, optical, electrochromic and colorimetric analysis. The deposited films were polycrystalline with cubic fluorite crystal structure of CeO_2 . The band at 539 cm^{-1} is assigned to Ce–O stretching vibration and band at 1020 for crystalline V_2O_5 . Hence, CeO_2 and V_2O_5 phases for all the samples (V2-V5) were confirmed from IR study, and thereby samples acquire $\text{CeO}_2/\text{V}_2\text{O}_5$ mixed composition. The ion storage capacity (I_{SC}) of $\text{CeO}_2\text{-V}_2\text{O}_5$ thin film with 4 vol% Vanadium was found to be maximum at 14 mC cm^{-2} in $0.5\text{ M LiClO}_4 + \text{PC}$ electrolyte. The optically passive behavior of $\text{CeO}_2\text{-V}_2\text{O}_5$ thin film was confirmed by its negligible transmission modulation ($\Delta T \sim 6\%$) upon Li^+ ion insertion/deinsertion, irrespective of the extent of Li^+ ion intercalation. The optical modulation of sputter deposited electrochromic WO_3 was found to be enhanced from 52 to 60% with rapid increase in coloration efficiency from 47 to $76\text{ cm}^2\text{C}^{-1}$ was observed when $\text{CeO}_2\text{-V}_2\text{O}_5$ is coupled as a counter electrode with WO_3 in an electrochromic device (ECD).

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1. Introduction:

Vanadium oxide (V_2O_5) is known to be a very good intercalation material whose main drawback, when used as counter-electrode in an electrochromic device, is its residual coloration in the reduced state [1]. The idea behind this study is to improve its optical properties without losing the charge capacity, suitable for working in tandem with tungsten oxide. CeO_2 has been studied in the last years for its use as a passive counter-electrode because it retains its high transparency in both the oxidized and the reduced state [2]. Moreover, it provides an efficient UV shield related to its strong absorption for wavelengths below 380 nm. Nevertheless, its reaction kinetics is slow and its charge capacity is not satisfactory for practical electrochromic applications. Several attempts have been made in order to improve its electrochemical properties by way

of mixing the oxide with other materials such as Sn, Ti and Zr oxides [3,4]. Recently, it was thought that the addition of CeO_2 to V_2O_5 might quench vanadium oxide's undesired residual coloration in the bleached state. In fact, cerium-vanadium mixed oxides made using the sol-gel route have proved to be interesting for their use as counter electrode in electrochromic windows [5].

In this work we present the structural, optical, morphological, and electrochromic properties of vanadium mixed cerium oxide ($\text{CeO}_2\text{-V}_2\text{O}_5$) thin films prepared by spray pyrolysis technique onto fluorine doped tin oxide coated conducting glass substrate which are helpful to enhance stability of ceria without diminishing its special features such as its unique redox properties.

2. Experimental procedure

Cerium nitrate hexahydrate [$\text{Ce}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$] (99.5%, Acros Organics), Vanadium tri chloride (VCl_3), methanol (99% Loba Chem) were used as received. Stock solutions of concentration of

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