

Dr. Mahendra R. Avaghade  
Dept. of Commerce  
Mamasahab Mohol College  
Paud Road, Pune-411038

**Introduction:**

Indian industry walking up to the challenges thrown by market economy. To survive in this highly competitive scenario, managers are being pressured to improve quality, increase productivity, cut down waste and eliminate inefficiency. The collective efforts of the employer and the employee assume relevance in this concept. And this is where human resource management can play a crucial role.

We use a lot of words to describe the importance of people to organizations. The term “human resources” implies that people have capabilities that drive organizational performance (along with other resources such as money, material and information). Other terms such as “human capital” and “intellectual assets” all have in common the idea that people make the difference in how an organization performs. Successful organizations are particularly adept at bringing together different kinds of people to achieve a common purpose. This is the essence of human resources management (HRM).

**Why Study Human Resource Management?**

As you embark on this course, you may be wondering how the topic of human resources management relates to your interests and career aspirations. The answer to the question “Why Study HRM?” is pretty much the same regardless of whether you plan on working in an HR department or not. Staffing the organization, designing jobs and teams, developing skillful employees, identifying approaches for improving their performance, and rewarding employee successes – all typically labeled HRM issues – are as relevant to line managers as they are to managers in the HR department.

To work with people effectively, we have to understand human behavior, and we have to be knowledgeable about the various systems and practices available to help us build a skilled and motivated workforce. At the same time, we have to be aware of economic, technological, social and legal issues that either facilitate or constrain our efforts to achieve organizational goals. Because employee skill, knowledge, and abilities are among the most distinctive and renewable resources on which a company can draw, their strategic management is more important than

ever. As Thomas J. Watson, the founder of IBM, said “You can get capital and erect buildings, but it takes people to build a business.”

**Competitive Challenges and Human Resources Management:**

Professional organizations such as Mercer, Watson Wyatt Worldwide, National Institute of Personal Management and the society for human resource management (SHRM) conduct ongoing studies of the most pressing competitive issues facing firms. By seeking the input of chief executives and HR managers, these organizations keep a finger on the pulse of major trends. For the past decade or so, there has been a constant theme around the following issues:

- Managing change,
- Embracing new technology,
- Responding to the market,
- Containing costs,
- Going global and
- Managing talent, or human capital.

These trends extend beyond “people issues” per se, but they all focus on the need to develop a skilled and flexible workforce in order to compete in the twenty first century.

**Challenge – 1: Managing Change:-**

Technology and globalization are only two of the forces driving change in organizations and HRM. Today, being able to manage change has become paramount to a firm’s success. As one pundit put it, “No change means change.” “Successful companies”, says Harvard Business School Professor Rosabeth Moss Kanter, “develop a culture that just keeps moving all the time”. Given the pace of today’s commerce, organizations can stand still for long. In highly competitive environments, where competition is global and innovation is continuous, has become a core competency of organizations.

**Challenge – 2: Embracing New Technology:-**

Advancements in information technology have enabled organizations to take advantage of the information explosion. With computer networks, unlimited amount of data can be stored, retrieved, and used in a wide variety of ways, from simple record keeping to controlling complex equipment. The effect is so dramatic that at a broader level, organizations are changing the way they do business. Use of the Internet to transact business has become so pervasive of both large and small companies that e-commerce is rapidly becoming the organizational challenge of the new millennium. Even following the “dot – com bust,” in which many promising new Internet

companies failed rapidly, the Web is transforming the way mediated relationships, and they are giving rise to a new generation of ‘virtual’ workers who from home, in hotels, in their cars, or wherever their work takes them. The implications for HRM are times mind boggling.

**Challenge – 3: Responding to the Market:-**

Meeting customer expectations is essential for any organization. In addition to focusing on internal management issues, managers must also meet customer requirements of quality, innovation, variety and responsiveness. These standards often separate the winners from the losers in today’s competitive world. How well does a company understand its customer’s needs? How fast can it develop and get a new product to market? How effectively has it responded to special concerns? “Better, faster, cheaper” – these standards require organizations to constantly align their process with customer needs. Management innovations such as total quality management (TQM) and process reengineering are two of the comprehensive approaches of responding to customers. Each has direct implications for HR.

**Challenge – 4: Containing Costs:-**

Investment in reengineering, TQM, human capital, technology, globalization, and the like all very important for organizational competitiveness. Yet, at the same time, there are increasing pressures on companies to lower costs and improve productivity to maximize efficiency. Like other functional department manager, human resource managers are now under pressure to show top managers the “bottom line” financial results that their departments are achieving. Labor costs are one of the largest expenditures of any organization, particularly in service and knowledge-intensive companies. Moreover, the healthcare costs of insuring workers and their families have skyrocketed in the past decade, posing a much bigger burden to firms. Organizations are taking many approaches to lowering labor – related costs. In addition to shifting some of the rising costs of healthcare back onto employees, in an attempt to enhance productivity. Each of these efforts has a big impact on HR policies and practices.

**Challenge – 5: Going Global:-**

In today’s competitive economy, Indian companies are seeking business opportunities in the global areas to grow and prosper. Competition and co-operation with foreign companies has been become an important focal point for businesses. The import export trend in India shows interesting movement over the past few years. Looking at the fact that India has become relatively an open economy post – liberalization (after 1991), it is expected that trade volume shall show an upward movement over the years. If we look at the trend, as given in Table 1.1

import bills have increased at a faster rate than the export earnings, which has resulted in increased trade deficit. More importantly, the major items of import are fertilizers and petroleum (and its derivatives). These are essential products and therefore, India cannot expect the import bill reducing drastically in the near future. India's export items are dominated by traditional natural resources and primary products such as gems and jewellery, tea etc. This shows that in spite of many incentives and encouragement (by way tax exemptions, indirect subsidies etc.) provided by the government, India continues to be a typical less developed country when it comes to creating a comparative or absolute advantage in manufacturing or service sector at a major scale.

**Table 1.1: Indian Foreign Trade Data**

Year	Exports	Imports	USD Trade Balance
2001	44560	50537	-5976
2002	43827	51413	-7587
2003	52719	61412	-8693
2004	63843	78149	-14307
2005	83536	111517	-27981
2006	103091	149166	-4607



			5
20	1263	1857	-
07	61	49	5938
			8
20	1629	2514	-
08	04	39	8853
			5

### Challenge – 6: Managing Talent, or Human Capital:-

The idea that organizations “compete through people” highlights the face that success increasingly depends on an organization’s ability to manage talent, or human capital. The term human capital describes economic value of employee’s knowledge, skills and company’s balance sheet; it nevertheless has tremendous impact on an organization’s performance. The following quotations from notable CEOs illustrate this point:

- “If you look at our semiconductors and melt them down for silicon, that’s a tiny fraction of the costs. The rest is intellect and mistakes.” Gordon Moore, Intel.
- “An organization’s ability to learn, and translate that learning into action rapidly, is the ultimate competitive business advantage.” Jack Welch, General Electric.
- “Successful companies of the 21<sup>st</sup> century will be those who do the best jobs of capturing, storing and leveraging what their employees know.” Lew Platt, Hewlett – Packard.

### Summary:-

1. People have always been central to organizations, but their strategic importance is growing in today’s knowledge-based industries. An organization’s success increasingly depends on the knowledge, skills and abilities of its employees.
2. Globalization influences the economy of most of the countries worldwide and affects the free flow of trade among countries. This influences the number and kinds of jobs that are available and requires that organizations balance a complicated set of issues related to managing people in different geographies, cultures, legal environment, and business conditions. HR functions such as staffing, training, compensation and the like have to be adjusted to take into account the differences in global management.

3. Advanced technology has tended to reduce the number of jobs that require little skill and to increase the number of jobs that require considerable skill, a shift we refer to as moving from touch labor to knowledge work. This displaces some employees and requires that others be retrained. In addition, information technology has influenced HRM through human resource information system (HRIS) that streamline HR processes, make information more readily available to managers and employees, and enable HR departments to focus on the firm's strategies.
4. Both proactive and reactive change initiatives require HR managers to work with line managers and executives to create a vision for the future, establish an architecture that enables change, and communicate with employees about the processes of change.
5. In order to "compete through people," organizations have to do a good job of managing human capital – the knowledge, skills and capabilities that have value to organizations. Managers must develop strategies for identifying, recruiting, and hiring the best talent available, for developing these employees in ways that are firm – specific, for helping them to generate new ideas and generalize them through the company, for encouraging information sharing and for rewarding collaboration and teamwork.
6. In order to respond to customer needs better, faster and more cheaply, organizations have instituted total quality management (TQM) and reengineering programs. Each of these programs requires that HR be involved in changing work processes, training job design, compensation, and the like. HR issues also arise when communicating with employees about the new systems, just as with any change initiative. Better business thinking builds more strategic HR thinking.
7. In order to contain costs, organizations have been downsizing, outsourcing offshoring, leasing employees, and enhancing productivity. HR's role is to maintain the relationship between a company and its employees while implementing the changes.
8. The workforce is becoming increasingly diverse, and organizations are doing more to address employee concerns are doing maximize the benefit of different kinds of employees. Demographic change, social and cultural difference and changing attitudes toward work can provide a rich source of variety for organizations. But to benefit from diversity, managers need to recognize the potential concerns of employees and make certain that the exchange between the organization and employees is mutually beneficial.
9. In working with line managers to address the organizations challenges, HR managers play a number of important roles; they are called on for advice and ethics counsel, for various service

activities, for policy formulation and implementation, and for employee advocacy. To perform these roles effectively, HR managers must contribute business competencies, state – of – the – art HR competencies, and change – management competencies. Ultimately, managing people is rarely the exclusive responsibility of the HR function. Every manager’s job is managing people, and successful companies combine the expertise of HR specialists with the experience of line managers to develop and utilize the talents of employees to their greatest potential.

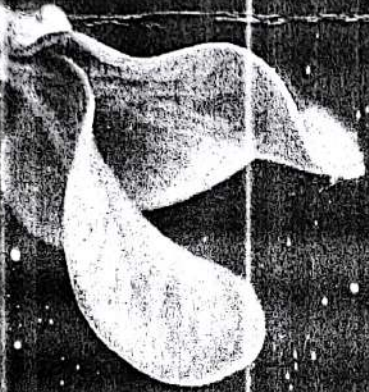
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## Index

Sr. No	TITLE	AUTHOR	PAGE NO
१.	No place as home an exploration into diasporic consciousness in novels of : F.Roopu, Vassanji, Malladi Amulya, Nadeem Aslam, Badami Anita and Ondaatje Michael.	Vijayalaxmi Kore	१
२.	Untouchable: Portrayal of an untouchable sweeper's life	Sachin M. Kale	९
३.	मैं विचलित हूँ : एक अस्वस्थ	विजयकुमार म., कुलकर्णी	१३
४.	बंगाली लोकगीतों में धार्मिकभावना	गणपती टी. आर्जे	१६
५.	२० वीं सदी का महिला कथा साहित्य : विकास के चरण	किशोरी बा. लोहिकरे	२०
६.	ना.श्री.मदनकर यादव कवितात्मक प्रतिभा और प्रतिक	प्रो. श्री.म.श्री.वहार	२४
७.	रचनात्मक साहित्य लेखन : सेन नामदेव	प्रो. अशोक मोहन	२९
८.	कवि : शैल न पाउलिन लिता	डॉ. अशोक लि. साठेडे	३३



E.

## ना.पां.महानेर यांच्या कवितेतील प्रतिमा आणि प्रतिके

पा.डॉ.एन.डी.पवार (मराठी विभाग)  
मानसहिव महोदय महाविद्यालय, पुणे ३८  
मं.नं.७८७५०६९८७

साठोतरी मराठी कवितेत ना.पां.महानेर यांच्या कवितेला महत्त्वपूर्ण स्थान आहे. महंकरांनी मराठी कवितेला नवकवितेचे अधिष्ठान मिळवून निचे आहे. त्याप्रमाणे नारायण सुर्व्यांची महानगरीय कविता, अरण कोलटकरांची मानवी जीवनातील दवलंती भावना व्यक्त करणारी कविता जशी महत्त्वाची आहे. त्याप्रमाणे ग्रामाण जीवन, तीव्रत रतीवाडी, पाऊस, भिके, दुष्काळ, त्यागून होणारी सामान्य माणसाचा होरपळ यांचे विवत स्पंदन व्यक्त करणारी महानगरीय कविता अगदी नागर वाचकांनाही जिकरे करणारी आहे. ती कविता कधी सरळ शब्दांतून व्यक्त होते तर कधी निसर्गाच्या हिरव्या वंतांतील प्रतिमातून प्रकटते.

ना.पां.महानेर यांचे 'रानतल्या कविता' (१९६७) 'वही' 'पाऊसाळी कविता' (१९८२), 'अजिंठा' (१९८४), 'पावसाड' (१९९७), 'पळसाडडची गाणी' (संघर्ष), 'गाथा शिवरायांची', 'तिची कलाणी', 'प्राथना द्यावना', 'इत्यादी काव्यसंग्रह प्रकाशित झाले आहेत. या काव्यसंग्रहांमधील त्यांच्या रचनेत निवड धानकविता आहे. गीतकाव्य आहे. लोकगीतांच्या वाचन असलेली पण कवीच्या स्वतंत्र व्यक्तित्वाचा आदिष्कार करणारी निसर्ग कविता आहे. मानवी जीवन विरोधतः ग्रामीण लोकांचे आणि निसर्ग यांची विवे निवृत्तपणे वितारणारी निसर्ग कविता आहे. 'अजिंठा', 'तिची कलाणी' सारखी कथा कविता आहे, आणि काहीसा शाहीरी वाचन असलेली देशी काव्यरूपाचा आदिष्कार घडविणारी 'गाथा शिवरायांची' ही चरित्र कविताही आहे. महानेर यांनी केवळ निसर्गाची, रानाची वास्तव्येचे बोलती केली म्हणून ते निसर्ग कवी आहेत असे नव्हे, तर निसर्गातील अवघी विलसिते स्वरूपासह कोणताही आडपडदा न ठेवता त्यांनी अगदी 'नन' स्वरूपात अस्मिततेचा स्पर्श होऊ न देता आपल्या कवितेत मांडली. आणि हेच ना.पां.महानेर यांच्या कवितेचे यापूर्वीच्या निसर्ग कवितेपेक्षा वेगळेपण आहे. त्याचे कारण निसर्ग हाच त्यांच्या जीवनाचा आणि कवितेचाही मूलाधार आहे. या कवितेचा आशय निसर्गाशी निगडित शब्द प्रतिमा आणि प्रतिके यातूनच प्रभावपूर्ण आणि अत्यंत आतिथ्यतेने व्यक्त होता. या शोधनिबंधात महानगरीय रूपाण कवितेतील प्रातिनिधिक प्रतिमांचे आणि प्रतिकेचे स्वरूप एवढ्यापुरताच मर्यादित विचार केला आहे.

महानगरीय कवितेतील प्रतिमा आणि प्रतिके यांचा विचार करण्यापूर्वी या संज्ञाचा वाडू.मर्यात अर्थ व स्थान याचा थोडक्यात परिचय करून घेणे आवश्यक वाटते. इंग्रजी समीक्षेतील 'इमेज', 'इमेजरी' या संकल्पनासाठी मराठीत आता 'प्रतिमा', 'प्रतिमासूची' या संज्ञा रूढ झालेल्या दिसतात. या संज्ञा संस्कृत साहित्यशास्त्रात आढळत नाहीत. प्रतिमा' या शब्दाचा कोशागत अर्थ

मूर्ती, चित्रित आकृती असा दृकसंबंदनेला जाणवणारा आहे. मानसशास्त्रामध्ये "इंद्रियसंबंदनेची स्मृतिरूप प्रतिकृती म्हणजे प्रतिमा"<sup>१</sup> अशी व्याख्या निरिचत केलेली असते. मात्र वाडूमयीन क्षेत्रात भावीक गुंतागुंतीची अभिव्यक्ती करण्यासाठी एखाद्या शब्दाचा किंवा शब्दसमूहाचा, शब्दबंधाचा आधार घेऊन त्यातून व्यापक अर्थ व्यक्त करण्याची प्रक्रिया असते, म्हणजेच प्रतिमा या केवळ संबंदनाचिचे अथवा स्मृतिचित्रये असत नाहीत, तर त्याच्याशी निगडित असणाऱ्या भावना आणि विचारांनाही या संकल्पनेत महत्त्वाचे स्थान असते. अनुभवाला गोठवून ठेवण्याची क्षमता प्रतिमेष्ये अन्वाची लागते. अनुभवाचे संश्लेषण करणे हा प्रतिमेचा महत्त्वाचा गुणधर्म आहे, असे लक्षात येते. म्हणजेच संहितेच्या विस्तारावर प्रतिमा नियंत्रण ठेवतात. संहितेचा परीन हा मर्यादित ठेवूनही तीच अर्थप्रतीती देण्यासाठी प्रतिमा महत्त्वाच्या ठरतात. म्हणूनच "प्रतिमा म्हणजे बोदीक व भावनात्मक अनुभवांचे संकीर्ण संकुल एका क्षणात प्रत्यक्षकारी पध्दतीने आविष्कृत करणारी शब्दरचना."<sup>२</sup> अशी व्याख्या एझरा पाऊडने केली आहे.

"प्रतीक ही संकल्पना चिन्हे आणि त्यांचे अर्थ यांच्याशी संबंधित आहे."<sup>३</sup> प्रतिमा, प्रतीक, रूपके, अलंकार इत्यादी काव्यपदकांची सीमारेषा अतिशय पुसट आहे. प्रतिमा आणि प्रतिके यांतील फरक हा सूक्ष्म संकल्पनात्मक असतो, हे प्रथमतः लक्षात घ्यायला हवे. प्रतिमा या संकल्पनेत व्यापक अर्थ गोठवण्याची क्षमता असते. तसेच तिचा वापर हा तुलना करणे किंवा संश्लेषण करणे या दोन महत्त्वपूर्ण कार्यांसाठी केला जातो. प्रतीके मात्र सर्वव्यापी, तुलनेने स्थलकालातील मानवी अनुभवाशी संबंधित असतात. एखाद्या संस्कृतीतील व्यापक व्यवस्था दर्शविण्यासाठी त्यातील छोटेदेणे चिन्हरी पुरसे ठरते. उदा.कुंकू हे हिंदू संस्कृतीचे प्रतीक, धम्मचक्र हे बौद्ध संस्कृतीचे प्रतीक, तर कुस हे ख्रिश्चन धर्माचे प्रतीक मानले जाते. म्हणजेच प्रतीकांना निर्दिशित व्यवस्थेचा थेट संबंध वास्तवशाशी असतो, हे स्पष्ट होते.

उदाहरणार्थ, मराठी कवितेत शंकराचा विश्रुळ हे हिंदू धर्माबरोबरच अन्यायाच्या परिमार्जनचे प्रतीक परंपरेने मान्य केलेले आहे. तर 'बी' कवींचा 'चाफा' हे प्रतीक काही समीक्षकांना प्रकृती पुरुष यांच्या सापुष्यप्रीतीचे प्रतीक वाटते, तर काहीना 'प्रिया-प्रियकर' यांच्या अथांगप्रीतीचे कवीनिर्मित प्रतीक वाटते. तसेच अजिंठांच्या 'थळ' कवितेचे प्रतिक हे सभोवतालच्या शुद्धजन्य असुचित व कोमेजलेल्या जीवनाचे प्रतीक आहे. तर कुसुमाप्रजांच्या 'आगाडी व जमीन' या कवितेतील प्रतिके अनुक्रमे जुलमी राजवट व सहनशील जनता यांची वाटतात.एकंदरीत दैनंदिन जीवनात अशी कितीतरी प्रतीके असतात. त्यांना कळत-नकळत कवी आपल्या कवितेत स्थान देतो. अशी प्रतिके किंवा चिन्हे यांचे डॉ. सुधीर रसाळ यांनी "विल्व अरबान या समीक्षकांच्या विवेचनाच्या आधारे (१) निर्देशनात्मक चिन्हे (२) आविष्कारात्मक चिन्हे आणि (३) पर्यायी चिन्हे असे तीन प्रकार त्यातील अधीक्षित अर्थासह नमूद केली आहेत."<sup>४</sup> वरील प्रतिके कवी कवितेत विशिष्ट अशा अमूर्त जाणवेलला अर्थ व्यक्त करण्यासाठी योजत असतो.

काव्याप्रतिमा ह्या कवींच्या व्यक्तिगत भावजीवनाप्रमाणेच त्यांच्या सांस्कृतिक जीवनातील व्यापक अनुभवासुष्टिनुही आलेल्या असतात. त्या काव्याशय अधिक स्पष्ट आणि विस्तृत करीत असतात,म्हणून कवी अजिंठासारखे प्रशिक्षयशा कवी काव्यप्रतिमांबद्दल लिहितात, "प्रतिमांच्या निर्मितीने आशयाची अभिव्यक्ती करणे हे उत्तम काव्याचे वैशिष्ट्य आहे. काव्याचा 'गुणस्तर' (रूढ शब्द



दरनंतरपण) त्यातील प्रतिमांमितीवर अवलंबून असतो. सहृदयाच्या मनात त्यांचे प्रतिबिंब पडून त्यांचे आकलन झाले, म्हणजे त्यालाही त्या भावनासंबंधाची जाणीव होते. " या विवेचनातून कवी अनित याने कवीच्या दृष्टिकोनातून प्रतिमेची निर्मिती व आवश्यकरता सांगितली असून सहृदय रसिकालाही त्या प्रतिमामुळे कवितेतील भावना विचारासंबंधी चांगली जाणीव होण्यास मदत होते, हे स्पष्ट केले आहे. ना.शं.महानोर यांच्या कवितेची रूप, रंग, गंध, स्पर्श, नाद, इत्यादींच्या विविध प्रतिमा आलेल्या आहेत. त्यामुळे त्या कवितेचा आशय कमी शब्दातून वाचकांना विविध अर्थ छटासह आणि कवीला अभिप्रेत असलेल्या भावनांसाठी प्रतीत होण्यास मदत होते.

त्याप्रमाणे 'नभ', 'भुई' ही त्यांची प्रतिमा केंद्र आहेत. आणि त्याची 'हळदी उज', 'केलहाळ पाखर' रंगविल्या दिशा, 'मी माझ्या ऐश्वर्याचा राजा', 'बहकते रान', 'हरवली वाट' यासारख्या अनेक प्रतिमांतून त्यांच्या प्रतिमांचे व्यापक क्षेत्र अनुभवयास येते. खरे तर महानोरांच्या कवितेतील 'नभ' आणि 'भुई' इतकी अशांची संपन्नता देलात की ती त्यांच्या कवितेची प्रतिकेच झाली आहेत, असे म्हटले तर वाचणे ठरू नये.

उदाहरणार्थ :-

"ह्या नभाने ह्या भुईला दान द्यावे  
आणि ह्या मातीतून चेतन्य गावे  
कोणती पुण्ये अशी येती फळाला  
जोषळादाला चांदणे लवडून जावे"

या काव्यधंकीतील 'नभ', 'भुई', 'मातीतील चेतन्य', 'जोषळादाला चांदणे लवडणे' या प्रतिमांनी क्वितीरी व्यापक अर्थ सूचित केला आहे. महानोरांचे 'नभ' आणि 'माती' या व्यापक निसर्ग केंद्राशी असलेले नाते, या मातीतील शेतांतून, आलेले जोषळादाला, चांदण्यासारखे लवडलेले धान्य आणि ते पाहून झालेला आनंद ही पूर्वजन्माची पुण्याई म्हणून अवर्णनीय आहे. 'भुई' हे निर्मितीचे प्रतीक, ती भुई अनेक आघात सहन करते, निसर्गातील विविध ऋतूंचे प्रहार झेलते. माणसाला आपल्या शिरावर घेऊन जीवनाचा आधार देते, त्याच्या भरण पोषणाचे सर्वकारी करते, आणि निसर्ग नियमानुसार आपल्या पोटातही घेते. 'नभ' ही देखील विशालतेची प्रतिमा घेऊन येते. आणि नुसते विशालत्व हेच या नभाचे वैशिष्ट्य नाही तर विविध ऋतूमानात होणारे बदल आपल्यात समावून विविध रंगाच्या ढगांची उधळण करतात. या नभानेही महानोरांना प्रचंड आकर्षित केले आहे. त्या नभशी मणःसाचे, विशेषतः शेतीशी निगडित माणसाचे, जीवन बांधलेले आहे. त्यामुळे 'नभ' देखील उठाव्या, पावसाच्या निर्मितीचे केंद्र आहे. त्याच्या विविध रंग रूपासह महानोरांनी सूक्ष्म निरीक्षण केले आहे.

महानोरांच्या कवितेत स्त्रीच्या रूपसौंदर्याचे आणि प्रेमभावाचे वर्णन करण्यासाठी आलेल्या 'कालीव लेणी', 'ऊनसाऊलीचे जाळे', 'विवस्त्र शिल्पीत हळदी झाड', 'चळ भरलेले अवघळ हान', 'ज्वार उभार', इत्यादी प्रतिमा विशेषता साधण्यासह येतात. त्यामुळे महानोरांचा निसर्ग, त्यांची पिके हाडामासाच्या मणःसासारखी विशेषता तरुण-तरुणींसारखी मुक्त (नानही) शृंगार विनोदिकत व्यक्ता करतात. त्यात एक प्रकारची नैसर्गिक व निरागस दृष्टी असल्याने या शृंगाराला अश्रिलेवा स्पर्श जाणवत नाही.

ना.शं.महानोर यांच्या कवितेतील प्रेमभाव देखील निसर्गप्रतिमातून चपखलपणे व्यक्त होतो. 'राजवन्सी पंजाचे पाखर' सहजपणे त्यांच्या प्रेयसीच्या अंगाशी लागू करतो. 'राजवन्सी' या शब्दप्रतिमंतून एक ऐदार, डोलवार, आकर्षक असा मिलनोत्सुक पशी ननरसमोर येतो. आणि त्यामुळेच त्याची प्रेयसी त्याचा लळा लागल्याने इतर पाखरांमध्य त्याचा ठावटिकाण शोधत असते.

'गोभुळ्या विवेला नवतीचा भार', 'फुलांचा राजसपणा', 'दुःखाचा काळिमा', 'अश्राप डोळे' अशा प्रतिमातून मानवी भाव, शरीरातील विविध अवस्था, द्रिश्य पातळीवर महानोर सहजपणे साकारतात.

उदाहरणार्थ :-

"हिरव्या पानात पानात काही चावळ चालते  
भर ज्वानीतील ज्वार अंग मोडीत बोलते  
शेत गव्हाचे पिवळे जरा नशेत झुलते  
आणि साळीचे उगाच अंग शहरून घेते"

या काव्यधंकीतील 'चावळ' या शब्दातून पानापानातील आवाज आणि माणसाच्या बोलण्याचा आवाज या श्रुती संवेदनेची प्रतिमा सहजपणे साकार झाली. पुढे उभारीला आलेली 'ज्वारीचे वाट' आणि तारुण्याच्या घाटात वावरणाऱ्या सौंदर्याची स्त्री या साधर्म्यदर्शक रूपप्रतिमा यौवन सुलभ तरुणींचे रूप वाचकांच्या डोळ्यांसमोर सहजपणे तरळतात. या प्रतिमा: मुद्दामहून शोषण्याचे कारण नाही. पण हेन तारुण्यातील स्त्रीचे शारीरिक व मानसिक गुणधर्म महानोर निसर्गातील नुसमसलेल्या ज्वारीच्या पिकात स्वाभाविकपणे पाहतात, आणि येथील निसर्ग मानवी पातळीवर त्याच्या गुणदोषासह केव्हा येतो हे ही लक्षात येत नाही. त्यामुळेच त्यांच्या कवितेतील साळीचे अंग शहरून घेते. गव्हाचे पीक तपतीचा आरवाह घेताना 'नशेत' झुलते, 'कालीव' रूपाची केळ आपले प्रतिबिंब पाण्यात शोधते. याप्रमाणे स्पर्श, नाद, आणि रूपाच्या प्रतिमा येथे सहजपणे प्रकटतात आणि मिळण्याचा ऐंद्रित अनुभवातून कवितेचा लक्ष्यार्थही कवितेची समृद्धी आणि खोली वाढवितो.

'अजिंठा' हे त्यांच्या एकरूपच कवितेच्या सौंदर्याचे, प्रेमभावनेच्या आविष्काराचे प्रतिक आहे. 'अजिंठा' बौध्दाच्या विरशांतीचे प्रतिक आहे. अजिंठा मित आणि पार यांच्या प्रभाचे प्रतीक आहे. त्यामुळे हा अजिंठा कधी निष्पर्ण झाडांचा दिसतो तर कधी मितल्या निळ्या डोळ्यात भस्मसात होतो. आणि पारच्या मत्सूनंतर घटलेला 'नालजदं अजिंठा' कधी काळ्या फत्तरीचा 'निश्चेतन अजिंठा' अजिंठाच्या डोंगरापासून गावापासून तापीपर्यंत मित आणि पारच्या प्रेक्षितरहाचे गीत गाणारा अखंड झपाचे प्रतीक आहे. बौध्द जातक कथातील बुध्दाचे चरित्र तर अजिंठागत आहेच. महानोरांनी या बुध्दकथेचे धागे निसटून देता 'अजिंठा' हे मित आणि पारच्या प्रेमकथेचे चिरंतन प्रतीक म्हणून आपल्या कवितेत मोठ्या संयमाने कलात्मकतेने आणि आपल्या डोंगर लेखनशैलीने चिरंतन स्वरूपात योजले आहे.

एकरूरीत महानोरांच्या कवितेत आलेल्या प्रतिमा ह्या निसर्ग, ग्रामीण लोकांजीवन, यातूनच आलेल्या आहेत. महानोरांचे लोकांजीवन, तेथील यांत्रिक जीवन, आणि जीवनसंघर्ष यापासून ही कविता आणि तिच्यातील प्रतिमा बचाव लांब आहेत. "एका स्वाभाविक लयीत लोकांजीवनातल्या घटकाभूत निर्माण होणाऱ्या प्रतिमांमधून महानोरांच्या कवितेवर या लोकांजीवनाच्या स्थातील प्रतिमांचा

आणि लोकांगितांच्या लयांच्या परिणाम आहे. ११ डॉ. नागनाथ कोतापल्ले यांच्या विवेचनावतून महानोरांच्या कवितेतील प्रतिमांचे मूळ लोकांगितात असून त्यांच्या व्यक्तित्वातही आहे. त्यामुळेच या प्रतिमांना एक स्वाभाविक लय प्राप्त झाली आहे, हे स्पष्ट होते. यावरून महानोरांच्या कवितेतील प्रतिमा या उपया नसून कवितेचा आशय समृद्ध करण्यास त्या रूप, रस, गंधाने युक्त अशा अंगभूत वैशिष्ट्यांसह आविष्कृत होतात यात शंका नाही.

संदर्भ :-

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Sr. No.	Article Name	Name of the Author	Page No.	Country/ State
1	Performance Evaluation by Using Balanced Scorecards: Analytical Vision	Dr. Majeed Abdul Hussein Hatif Al-Maryani	01-08	Iraq
2	Marital Discordance in Manju Kapur's <i>Difficult Daughters</i>	J. Bala Subramaniam, Mrs. M. Gayathri	09-13	Madhyapradesh
3	Working Capital Management of Pudumjee Pulp & Paper Mills Limited - Analytical study	Prof. Yashodhan P. Mahajan	14-21	Pune
4	Predictive Measurements for Increasing Advertising Effectiveness	Capt. Dr. Ashok V. Giri	22-27	Pune
5	Management of Non-Performing Assets in Public Sector Banks	Dr. Bhikhal V. Moraliya	28-35	Gujarat
6	Relationship between Motivation and Level of Job Satisfaction Among College teachers in Greater Mumbai: An empirical study	Dr. Mohammad Khalil Ahmad	36-45	Mumbai
7	Image of a Woman in <i>Conilda</i>	Md. Afrozuddin, Dr. V. B. Chhabra	46-52	Andhra Pradesh
8	Effects of Economic Reforms on Poverty	Dr. Moregaonkar Santosh M.	53-64	Pune
9	BIB-Green Packaging solution for Indian Wine Industry	Dr. Aditi Raut, Dr. Jayashree Bhakay	65-68	Mumbai
10	Influence of HICO-110R on water relations, photosynthetic pigments, stomatal regulation and yield of groundnut under water stress condition.	Pawar S.G., Pawar S.S., Kambale V.M.	69-73	Pune
11	Women in a <i>Portrait of the Artist as a Young Man</i> . ( <i>Search, Escape and Refuge</i> )	Vikki M. Gaikwad	74-79	Pune
12	Challenges of Human Resources Management	Dr. Mahendra R. Avaghadde	80-84	Pune
13	Life Insurance Contracts: A Riddle of Unfair Practices for Guiltible Consumers	Asst. Prof. Vijay A. Chavan	85-91	Pune
14	Biomedical Waste Management in India	Mr. Lalit Kumar Sharma	92-99	Rajasthan
15	डॉ. बाबासाहेब आंबेडकर यांचे भारतीय अर्थव्यवस्थातील योगदान	डॉ. विष्णू फुलंबरे	100-104	राज्य
16	भारतातील चवदावाऱ्या साहित्यातील शैली	प्रो. डॉ. नारायण धो. पवार	105-111	गुजरात

मराठी व्यवहाराल 'शैली' ही संकल्पना सर्वसाधारणपणे रीत, पद्धत, बळण, लक्ष्य, दृढ, धारणी, वैशिष्ट्य, कोशस्थ इत्यादी अर्थानी वापरली जाते. साहित्यव्यवहारापेक्षा मात्र 'शैली' या संकल्पनेचे मूल्य निराळे आहे. साहित्यकृतीचे, साहित्यिकाचे, वाङ्मयप्रकाराचे, कालखंडाचे स्थलकालसामोक्ष असे स्वतंत्र तत्त्व या संकल्पनेत अभिप्रेत असते. 'शैली' ही संकल्पना प्रामुख्याने 'भाषाशैली' याच विवक्षित अर्थाने वापरली जाते. शैलीचा संबंध भाषाशैली अंतर्गत असला, तरी या संकल्पनेला केवळ भाषेपुरते मर्यादित करता येत नाही. साहित्यकृतीतील भाषाशैलीकडे अनुस्यूत असताने मात्र अर्थही शैलीद्वारे व्यक्त होत असतो, हे ध्यानात घ्यावे लागते. 'एखाद्या व्यक्तीला विशिष्ट भाष्यमाद्वारे विशिष्ट रूपापेक्षे प्रकट करण्याकरिता वापरल्या जाणाऱ्या तंत्रसमुच्चयाची पद्धती म्हणजे शैली', अशी एक व्याख्या काव्यात येते. याच व्याख्येची साधर्म्य असणारी दिलीप धोंगडे यांची व्याख्या आहे, 'हे म्हणतात, 'साहित्यिकाचा एकंदर अनुभव, तो अनुभव घेण्याची त्याची तंत्रकस पद्धती व साहित्याद्वारे तो अनुभव कलात्मकरीत्या अभिव्यक्त करण्याची त्याची तंत्रपद्धती याचा समुच्चय म्हणजे शैली.' म्हणजेच शैलीचे साहित्यशैली आणि भाषाशैली असे दोन भाग मानले जातात. साहित्यभाषेमध्ये कलात्मकता व ललितत्व निर्माण होण्यासाठी 'नव्हे, साहित्यिकाच्या अनुभवाभिव्यक्तीची माणगी म्हणून भाषिक व्याकरणाची मॉडर्नाई केलेली जाते. अशा 'वेळी' व्यवहाराभाषा, प्रमाणभाषा आणि साहित्यभाषा यांच्यातील समीपता स्पष्ट होते. 'निवड' हा परक शैलीमध्ये महत्त्वाचा ठरतो. साहित्यिकाला त्याच्या भाषाभांडारातील अनेक भाषिक पर्यायांमधून विशिष्ट पर्यायांमार्फत पर्यायांची

निवड करावयाची असते. म्हणूनच 'पर्यायांचे पर्यायार्थात निवड' म्हणजे शैली' असेही म्हंटले जाते. ही निवड स्थलकालपरिस्थितीसामोक्ष असते. त्यामुळे प्रत्येक व्यक्तीला निराळी तत्वे, त्यांची जाणवणी भिन्न शैली प्रकट करण्यास कारणीभूत ठरतात. येथे झुपू नि १७५३ साली आपल्या एका व्याख्यामधून मांडलेल्या 'शैली' म्हणजे 'लेखक' (लेखक की गय लक्ष्य) या सूत्राची व्यापकता लक्षात घेते.

यशवंतराव चव्हाणांच्या साहित्याच्या शैलीदृष्ट्या अभ्यास करता असे दिसते की, त्यांनी ललित साहित्यकारांवर शैलीचे दृष्टान्त घडवले. भाषा, आशय आणि अभिव्यक्तीच्या दृष्टीने त्यांची ही शैली निराळी ठरताना दिसून येते. त्यांच्या शैलीची काही वैशिष्ट्ये हिम्बूत केलात. याचा शोध या प्रकरणापेक्षा घेण्याचा प्रयत्न केला आहे.

#### १. वरतुल्य शैली

महाराष्ट्रातील आणि देशातील सामान्यांतील सामान्य माणसांला यशवंतराव चव्हाणांच्या वरतुल्यशैलीचे प्रबोधित केले होते. महाराष्ट्रातील मराठीची खरी अस्मिता यशवंतरावांनी प्राणपणाने जाणवली आणि आपल्या 'धुमासदार' शैलीने श्रुतिसमुद्राला हलवले-डोलवले-मधुमधु केले होते. हे त्यांच्या सध्यांरीचे गारे गुणाल, भूमिका या भाषण संग्रहातील भाषणांच्या शैलीवरून सहज लक्षात येते. म्हणजेच यशवंतराव चव्हाणांच्या वरतुल्य शैली मोहिनी होती.

यशवंतराव चव्हाणांकडे राजकीय कर्तृत्वाचा, यशस्वी तत्त्वाणाचा, प्रशासकीय कौशल्याचा, अभ्यासपूर्ण विचाराणा आणि अविचल निश्चिन्नाचा भाग होता; तसाच त्यांच्याकडे संघर्षी, संस्कारित, प्रसंगोचित आणि ललितव्यपूर्ण



आविष्कार-निवृत्तबाही कर माला भंग होला. लोकांना ओकरीत कोले, असो वदुल्लशीती यशवंतराव चव्हाणांचो अर्थ. एग त्याचवांगेर त्यांच्या भावनांतलें अजयल्लें अभिजात, साहित्यिक, तंत्रिक आनी ताचो रूची विलोभनीय असल्याचे दिश्टी येते. यशवंतराव चव्हाण वरवीं येवंचें विद्यालयांत शिक्षण घेत असताना त्यांना वदुल्लसपत रचणे १५०/- (त्या वेळचे)पारितोषिक मिळतले तें. हो घटना आठ शाला, मल्लिचार्जुनाय शिक्षण उंचाव्णा विद्यापीठान प्रणोदावीच आहे. यशवंतराव चव्हाणांचें वदुल्ल हे शाळेंतू विकसित झाले. ते विद्यालयांतले बालवाच्या गावांत जाऊन, भाषण करत असत. या कार्यामुळे लोकजागृतीचे काम यशवंतराव चव्हाणांनी विद्यार्थीदश्यांतूच केलेले दिसून येते.

यशवंतराव चव्हाणांच्या वदुल्लशीतीच्या विचार करताना; काळ, वेळ अर्थात विषयाचे भंग देवूनच ते वावुरत आसात. भाषणाच्या संदर्भांत ते स्वतांचो अर्थो पदुत वापरता. शब्दांचेर पूर्णपणे नियंत्रण आनी श्रोत्यांच्या भावना दुखवाणार मागीर, वाकडें त्यांचे तशेंच अर्थ. त्यांच्या वदुल्लशीतीच्या विचार करताना समोरलें आनी इतर ठिकाणांचे वदुल्ल वाचा एकत्रित विचार या ठिकाणी कायद्याचा प्रयत्न करता आहे. यशवंतराव चव्हाण यांच्या वदुल्लशीतीचे विचारांचो कळताना 'आधुनिक महाराष्ट्राच्या मंडळशीत शिल्पकार' या लेखांत डॉ. भावना काडेंकर लिहिताल की, 'ज्ञानेश्वरांच्या आंगीत यशवंतराव जीवनाची भयना, विशालता आनी दिश्टीता वचत असत, तर उक्ताभाषांच्या अभांगत जीवनाचे रूप, स्वरूप आणी आशय वचत असत. तर शाहीरांच्या पोवाड्यांत मराठीचा व मातळ्यांचा पराक्रम त्यांना नवमस्तक व्हायला लागील असे. पंडितांच्या विद्वत्तेविशीं ते विनम होऊन आपला आदर शब्दरूपाने, वदुल्लवाने व्यक्त करीत आसात. वेगळें अर्थज्ञानाच्या लेखांतूच दर्शित होणारें कलाविशय त्यांना अभिमानास्पद वाटत असे, तर मराठी लेखांतलें गुणधर्मांला जीवनांतलें निवल्याचा पवित्र सूर्य झाला असल्याचे त्यांना

जाणत असे. 'याबन यशवंतराव चव्हाणांचे वदुल्ल भेजेक कसे होतें, हे लक्षांत घेते. त्यांचा जीवनांतलें प्रत्येक गोष्टीकडे बघपाच्या दृष्टिकोना किती व्यापक स्वरूपाचा होला, याचा प्रत्यय येवपी येत रावता.

पुणे विद्यापीठांतूच मागट डी.टि.ए. उपाधी स्वीकारताना, विद्यापीठाच्या समोर बांलांताना यशवंतराव चव्हाण म्हणाले, 'जे शिक्षण चांगल्याची जडणघडण करीत नाहीं, ते पूर्णपणे कुचकामी शिक्षण होय. नीतिसेवासुरूप विला होणारें किंवा विला विरोधी असलेलें शिक्षण हद्दपूर केले जावं. शरीर, मन आणी आत्मा यांच्यामध्ये जोपर्यंत सुसंबाद नाहीं, तोपर्यंत कोणतीही न्याय्य गोष्ट होणार नाहीं, असे माधीची म्हणत. त्याला अर्थ आहे, आपल्याला जे खरें जीवन जागवपाचे असेल, तर आपण मागीरक निष्कलना टाकून दिली पाहिजे. तरेच आपले जीवन अतिशय सोपें होईल. अशी महत्त्वाची सूत्रे मी माधीचीकडून स्वीकारायच्या प्रयत्न करता आहे.' यानें यशवंतरावांचो शिक्षणविषयक विचारांचो भूमिका स्पष्ट होवपास मदत होते. डॉ. प्रभाकर माचरे हे आपल्या आठवणीं लिहिताना, 'केवावसुतांच्या जन्मशतव्दीनिमित्त दिल्ली शोधित साहित्य अकादमींत ग्रंथ विनोदनाचा समाज होला. साहित्यिकांच्या निवडक श्रुतिसभेत केवावसुतांवदत विद्वानां - इंग्रजीत वदुल्ल करून आपला प्रोबे सती अभिप्राय दिला की, 'केवावसुतांच्या वेगळें तीन-चार कविताच श्रेष्ठ साहित्यिकक्षेत्र मांडतील बरें. यशवंतराव चव्हाणांनी अथशायी भोगाल केवावसुतांच्या प्रणोदाची ओळीच्या आळी उरुतूत करून शब्दी म्हणाले, 'कवी, प्राध्यापक, टीकाकार काही म्हणून, म्हणणपी आम्ही त्या क्षेत्राचे भावजून गेलो होतो. त्या सामाजिक समस्येची प्रेणा केवावसुतांची दिती, श्रावण्य नाहीं. हिंदूही नाहीं ती ही एक धवता - तेच परित करीत की जे आडळीत प्रवेश साकल्याचा' हा संदेश केवावसुतांच्याच. 'याबन स्वतःला गाठ व्यापती म्हणणान्या कित्येक विद्वानां यशवंतराव चव्हाणांनी आपल्या मार्मिक वदुल्लशीतीन सहज पिप्रम केले होतें, हे दिश्टी येते.

मुळ्यांनी, संक्षेपानें, गूढ, अर्थ, परावृत्तनी, बारीकी पक्षेने प्रदायक यशवंतराव चव्हाणांनी विविधमंडळांमध्ये, लोकसभेमध्ये जी वेळोवेळी भाषणे केली; त्यांतूच याची वदुल्लशीती दिश्टी येते. तरेच यशवंतराव चव्हाणांचे संसदीय नेपथ्य पुरेपू व्यक्त होतें. विशीं प्रसन्नस्थाना विरवासांत उंचाचे त्यांचे स्वरुचे असे खास तरे असल्याचे दिश्टी येते. यशवंतराव चव्हाण एक मानव्य संसदपूर, सत्याची साक्ष त्यांच्या अनेक समकालिनांनी दिली आहे. त्यामध्ये जनीकुणभन हे आपल्या चव्हाण अंशूद दि द्रबलड डके ड या प्रवात लिहिताना, यशवंतराव चव्हाण त्या काळांत सतल्ले बाकावचे सवांतम बनें टारले होतें. भागुल्लच नव्हे, तर बाहोसुद्धा. वदुल्ल हे चव्हाणांच्या नेवृत्तयेचें मौलिक साधन होतें. शिवायसभेर लल्लचलक प्रवचने हे कधीच शोडीत नसत. मोजके आणि प्रसंगींचित तेवढेच बोलतात. 'याबन यशवंतराव चव्हाणांच्या वदुल्लशीतीचा परिचय होवपास यशवंतराव मद्रत होतें. याचोच अर्थ सभगृहांतले त्यांचे बोलच अथवासपूर्ण आणि वदुल्लित तर असतयचच, शिवाय जमहिरेकडुडी त्यांच्या मुळाशी असल्याची साक्ष लेखनाच्याला तांबडोचलें मिळत नाहीं. कारण त्यांच्या भाषणशीतींत त्यांचे प्रसंगावधान, वैचारिक समतोल, लल्ल अस्तल्याचे दिश्टी येते. १९६६ साली संक्षेपानें असताना स्वतःसाहित्यनिमित्ताने सैनिकांना आणि जमतेला उदरपूर केलेल्या भाषणांत यशवंतराव चव्हाण म्हणालात. 'भारतीय सैनिकांनी या देशांतलें नागांकान्तिची जशा राष्ट्रीय भावनेचे आरथा बाळाळी पाहिजे, तरेच नागांकान्तीही सैनिकांकडे कौटुंबिक भावनेचे पाहिजे पाहिजे. तर गोवाविषया विमलंथाच्या 'शंकी, ज्वाणेने भादूर काव्हाणांच्या तांबड्यांच्या सौम्यते निवा आमापत्या किन्न श्राडीत आसल्या सीमेचे रक्षण करीत उभा असतलेला भारतीय सैनिक आपल्या विशाल कुटुंबाचा पटक आहे; या भावनेने आपण बागते पाहिजे. त्याच्याशी आपले नाते कृपिम नाहीं, कौटुंबिक विवेक्याचे आहे, असे मानले, तर भारतीय सैनिकांच्या खडत जीवनांत

प्रयत्न करून त्याप्रमाणें आपण जमने पाहिजे. म्हाणारेच प्रत्येक नागांकांचे वर्धन करूं. काय आपल्या राष्ट्राचे भविश्य अवलंबून उरूंन, ज मुक्ति संदेश यशवंतराव चव्हाणांनी या विचारांमधून मांडला आहे. विचार मांडताना भावनात्मक शीतनीचा वापर येथे ते करताना दिसतात. अत्यवकृत तो आशय व्यक्त कायद्यासाठी भाषेच्या या रचनात्मक स्वरूपाचे वेगळेपण यशवंतराव चव्हाणांच्या शीतनिमित्त अनेकदा पहावयास मिळते. यशवंतराव चव्हाण ताडकीच न्ने म्हणुन सुविख्यात होतें. लोकशाहीच्या समुदीलता वदुल्लशीती असलेलें देणगी लागली, तर विचारांचे बाबतकणी सोने कसे बनते, याचे यशवंतराव चव्हाण हे मूर्तिमंत उदाहरण आहे. विविध प्रकारच्या बाबतांमुळे त्यांच्या विचारांत प्रातभता आलेली होती. लोकशाही, समाजवाद, मानवता, हुकुमशाही, राजकारण अशा कोणत्याही विषयांचे यशवंतराव चव्हाणांनी मुदरपूर विचार प्रवाची शीतलेंतूच मांडलेले आहेत. विचारांचे आणि विचारांनी त्यांची भाषणे पांपणे शक्यतेची आगत, कला, साहित्य, नाट्य, विद्यार्थी, पदवीदान समारंभ, उदरपूर अशा विविध विषयांचेर त्यांनी तालिल्लपूर्ण भाषणे दिली आहेत. ही सर्व भाषणां यशवंतराव चव्हाणांच्या नवा विचार सांपूर गेलेली दिसतात. कोणताही विषय त्यांनी आपल्या बाणांचे मधुर केला आहे. हेच त्यांच्या वदुल्लशीतीचे वैशिष्ट्य म्हणता येईल.







३. यशवंतराव चव्हाण यांनी लेखनशैलीमध्ये प्रतिनयना शान साहित्यिकपेक्षा चांगले शब्द उपलब्ध आणल्याचे दिसते.

४. यशवंतराव चव्हाणजी लेखनाची भाषा ही ओंबवती आणि वाचकांच्या मनाला आकर्षित करणारी असल्याचे आढळते येते. हेच त्यांच्या भाषाशैलीचे प्रमुख वैशिष्ट्य आहे.

५. त्यांच्या लिखाणामध्ये कौटुंबिक भावना, विव्हाळा, मानवतावाद इत्यादींना प्राधान्य दिल्याचे दिसते.

६. यशवंतराव चव्हाणजी लेखनशैली, बहुतेक शैली आणि प्रस्तावना स्वतंत्र अथवासावा विषय होऊ शकतात. त्यामगचे मुख्य कारण भाषाशैली हे होय.

७. यशवंतराव चव्हाण राजकाणाला गंते नवते, तर फार मोठे साहित्यिक झाले असते. हे त्यांच्या लेखनशैलीवरून निदर्शनास येते.

कोणतीही कलाकृती व तिच्याशीत आशय हा विशिष्ट भौष्या माध्यमातून आविष्कृत होत असतो. आशय आणि अभिव्यक्ती यांचे एकरूपत्व किंवा अभिव्यक्त्ये कलाकृतीमध्ये साधणे अपेक्षित असते. यामध्ये अभिव्यक्ती किंवा आविष्कार यांचा संबंध निवेदनशैलीशी आहे. कलाकृतीमधील आशय, अभिव्यक्ती प्रथमपुरुषी, द्वितीयपुरुषी किंवा तृतीयपुरुषी

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पद्धतीने केला जातो. तसेच साहित्यप्रकारानुसार निवेदन, किंबदन्तीही बदलते. साहित्यिकाच्या व्यक्तिमत्त्वानुसारही तिचा विविध पुराणे पुढे जातात. यशवंतरावांच्या सगळ्या साहित्याचा विचार करता, त्यांच्या कृष्णाकांड या आत्मचरित्रामध्ये प्रथमपुरुषी निवेदनशैलीचा वापर त्यांनी केलेला दिसून येतो. तर काही ठिकाणी द्वितीयपुरुषी निवेदनशैलीही दिसून येते. साक्षात्हीच योरे, शुभारंभ, भूमिका, या त्यांच्या भाषाशास्त्रांमध्ये तृतीयपुरुषी निवेदनशैली प्रकटाने जाणवते. परंतु संमिश्र शैलीही काही ठिकाणी दिसून येते. बहुतेकपूर्वता आणि काव्यमयता ही यशवंतरावांच्या लेखनशैलीची वैशिष्ट्ये त्यांच्या भाषाशास्त्रांमधून जाणवतात. किंबदन्ती त्यापुढेच ही भाषणे प्रभावी बनली आहेत. ऋणानुबंध, या ललितलेखसंग्रहात त्यांनी जी विविध व्यक्तित्वे रेखाटली आहेत, त्यांना विषयय शैलीबरोबरच त्यांच्या काव्यात्मवृत्तीची जोड लागलेली आहे. याशिवाय विद्याधी, यशवंतराव, चळवळीतील यशवंतराव, मुळमत्री, कैद्रीधमनी, साहित्यिक यशवंतराव या त्यांच्या जीवनप्रवासानुसार त्यांच्या व्यक्तिमत्त्वामध्ये परिपक्वता आणि प्रारंभता जाणवते. त्याचाही परिणाम त्यांच्या शैलीवर दिसून येतो.

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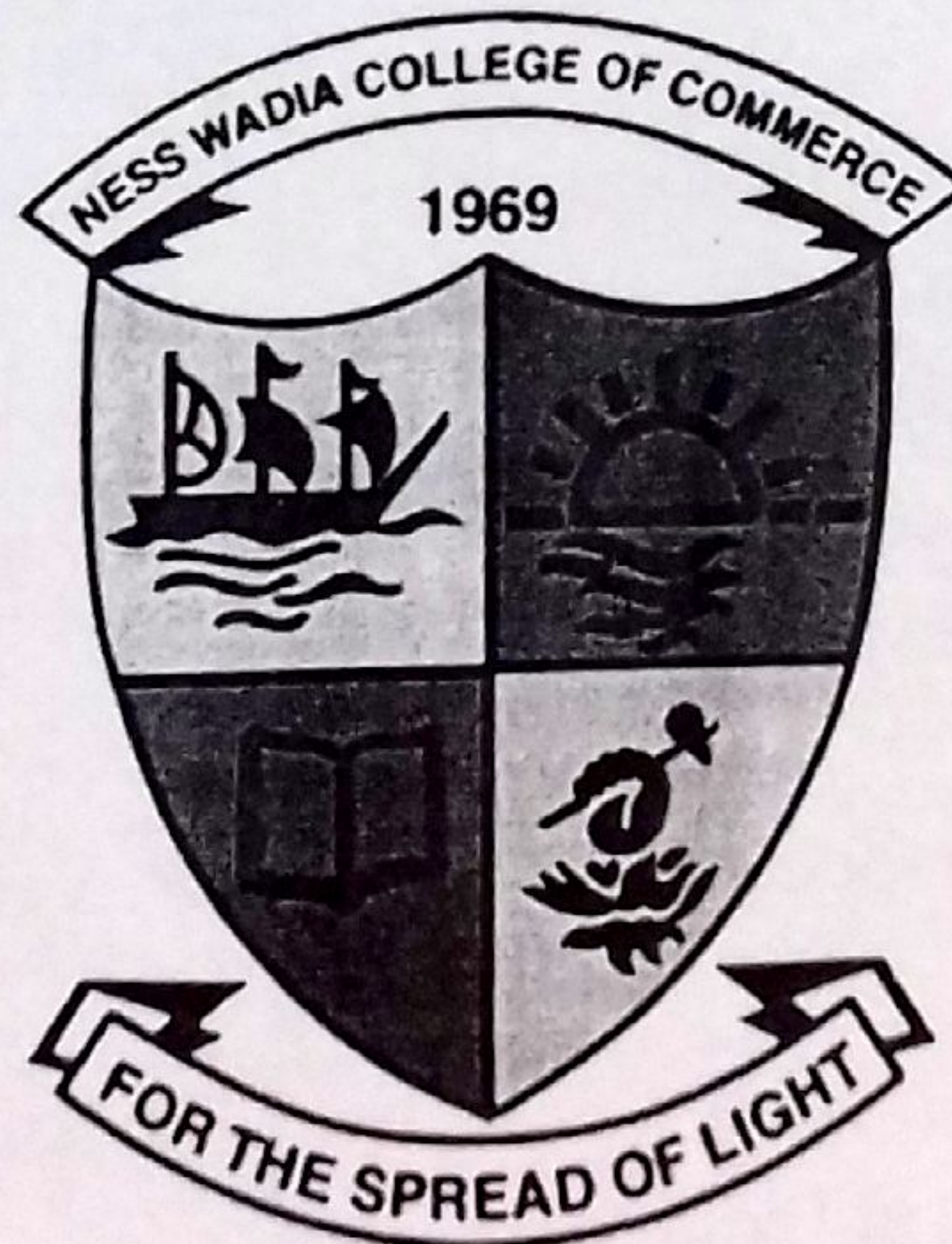
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# Index

Sr. No.	Title of Paper	Author	Page No.
1	Environmental Accounting and Reporting Practices: Global Scenario	Dr. Abbas Lokhandwala	1 to 6
2	Effective Corporate Governance Practices: Audit Committee	Dr. Ajinat Maruti Doke Mr. Sandip Ashok Wakde	7 to 11
3	Human Resource Accounting	Ms. Bharti K, Deshmukh	12 to 18
4	Green Accounting and Green Auditing	Mr. Ambadas T. Bhosale	19 to 27
5	Forensic Accounting	Dr. Satish Bhosale	28 to 35
6	Developments and Progress of Primary Agricultural Credit Societies	CA. Ashok Uttam Mojad	36 to 42
7	Corporate Social Responsibility (CSR) under the New Companies Act, 2013 *	CA Kisan D. Gargote	43 to 46
8	A Study on Critical Issues in Accounting Research	Dr. Dattatraya T. Chavare	47 to 53
9	Methods of Human Resource Accounting	Mr. D. S. Wadje	54 to 59
10	Social Audit	Dr. S. S. Deobagkar	60 to 67
11	Importance of Human Resource Accounting in the Organization	Dr. Kishor S. Desarda	68 to 71
12	Importance of Human Resource Audit in the Organisation	Mr. B. B. Landage Dr. Kishor S. Desarda	72 to 75
13	Forensic Accounting	Dr. H. M. Jare	76 to 81
14	Need of Environmental Accounting and Its Disclosure Practices in India	Dr. Kishor Girish Nawale	82 to 88
15	Influencers of Business Management	Dr. S. K. Wadekar	89 to 95
16	Human Resource Accounting: The Financial Impact of behavior in organizations	Dr. Sunil Zagade	96 to 102
17	Social Audit: A New Perspective	Dr. Vandana V. Pimple	103 to 108
18	Corporate Social Reporting and Regulatory Environment in India	Dr. Arun H. Gaikwad	109 to 113
19	An evaluatory study of trends in Investment & its impact on Investment planning	Mr. Gongatepatil Sudam	114 to 120
20	The need of Human Resource Accounting in Current Scenario	Dr. T. D. Gunjal Mr. K. R. Lipare *	121 to 126



## The need of Human Resource Accounting in Current Scenario

**Dr. T. D. Gunjal**

PDEA'S Prof. Ramkrishna More  
Arts, Commerce & Science College  
Akurdi, Pune  
Mobile: 8149238920

**Mr. K. R. Lipare**

PDEA'S Prof. Ramkrishna More  
Arts, Commerce & Science College  
Akurdi, Pune  
Email: kishor\_lipare@rediffmail.com

### Introduction:

Success of corporate undertakings purely depends upon the quality of human resources. It is accentuated that; Human element is the most important input in any corporate enterprise. The investments directed to raise knowledge; skills and aptitudes of the work force of the organization are the investments in human resource. In this context, it is worthwhile to examine human resource accounting practices in corporate sector in India.

Human resource accounting is of recent origin and is struggling for acceptance. It is clearly said that, Human resources accounting is an accounting measurement system and a large body of literature has been published in the last decade setting for the various procedures for measurement. At the same time the theory and underlying concepts of accounting measurement have received sizeable attention from academics and a substantial body of literature has developed. The conventional accountings of human resources are not recognized as physical or financial

The present scenario is that, despite the global change, human resource has always been considered as a 'soft issue' whose contribution could not be measured in tangible monetary terms. It was thus but natural that conventional method of financial accounting neither formally did not record investment in employees, nor did they deal with issues relating to measurement, valuation & accounting of HR. Of late there has been advancement in this area with many models being developed to carryout HR Accounting.

**Key Words:** Human Resource Accounting, Current Scenario

### Objectives of the Study:

1. To study the concept of Human Resource Accounting and its various aspects
2. To Point out the need, importance and limitations of Human Resource Accounting
3. To review the current scenario of Human Resource Accounting in world and India with deterrents.



### **Concept of Human Resource Accounting:**

The concept of human resource accounting can be better understood if one goes through some of the important definitions given by the competent authors in the accounting field.

The American Accounting Society Committee on Human Resource Accounting defines it "Human Resource Accounting is the process of identifying and measuring data about human resources and communicating this information to interested parties." In simple terms, it is an extension of the accounting principles of matching costs and revenues and of organizing data to communicate relevant information in financial terms. Mr. Woodruff Jr. Vice President of R. G. Batty Corporation defines it as "Human Resource Accounting is an attempt to identify and report investments made in human resources of an organization that are presently not accounted for in conventional accounting practice. Basically it is an information system that tells the management what changes over time are occurring to the human resources of the business." Prof. M.N. Baker defines Human Resource Accounting as "Human resource accounting is the term applied by the accountancy profession to quantify the cost and value of employees to their employing organization"

Thus, human resources accounting may be defined as, "a process of accounting which identifies, quantifies and measures human resources for the use of management to cope up with the changes in its quantum and quality so that equilibrium could be achieved in between the required resources and the provided human resources".

### **Objectives of Human Resource Accounting:**

1. To allow management personnel to monitor effectively the use of human resources.
2. To provide a sound & effective basis for human asset control, that is, whether the asset is appreciated, depleted or conserved.
3. To furnish cost/value information for making management decisions about acquiring, allocating, developing & maintaining human resources in order to attain cost effectiveness.
4. To help in the development of management principles by classifying the financial consequences of various practices.

### **Importance of Human Resource Accounting:**

Human Resource Accounting provides useful information to the management, financial analysts and employees as stated below:

1. It provides a basis for planning of physical assets vis-à-vis human resources.
2. It assists in evaluating the expenditure incurred for imparting further education and training in employees in terms of the benefits derived by the firm.
3. It helps to identify the causes of high labour turnover at various levels and taking preventive measures to contain it.



4. It helps in locating the real cause for low return on investment, like improper or under-utilization of physical assets or human resource or both.
5. It helps in understanding and assessing the inner strength of an organization and helps the management to steer the company well through most adverse and unfavorable circumstances.
6. Human Resource Accounting helps the management in the Employment, locating and utilization of human resources.
7. It helps in deciding the transfers, promotion, training and retrenchment of human resources.
8. It provides valuable information for persons interested in making long term investment in the firm.
9. It helps employees in improving their performance and bargaining power. It makes each of them to understand his contribution towards the betterment of the firm vis-à-vis the expenditure incurred by the firm on him.

### **HRA in current scenario:**

It is true that worldwide, knowledge has become the key determinant for economic and business success, but Indian companies focus on 'Return on Investment' (RoI), with very few concrete steps being taken to track 'Return on Knowledge'. What is needed is measurement of abilities of all employees in a company, at every level, to produce value from their knowledge and capability. "Human Resource Accounting (HRA) is basically an information system that tells management what changes are occurring over time to the human resources of the business. HRA also involves accounting for investment in people and their replacement costs, and also the economic value of people in an organization. The current accounting system is not able to provide the actual value of employee capabilities and knowledge. This indirectly affects future investments of a company, as each year the cost on human resource development and recruitment increases. Experts point out that the information generated by HRA systems can be put to use for taking a variety of managerial decisions like recruitment planning, turnover analysis, personnel advancement analysis and capital budgeting, which can help companies save a lot of trouble in the future. On balance sheet organisations can actually find out how much they can earn from an individual, as the intellectual assets of a company are often worth three or four times the tangible book value. Human capital also provides expert services such as consulting, financial planning and assurance services, which are valuable, and very much in demand.

Realising this, many companies world-over are making HRA as a necessary element on their balance sheets. One of the best examples is of the Denmark Government. The Danish Ministry of Business and Industry has issued a directive that with effect from the trading year 2005, all companies registered in Denmark will be required to include in their annual reports information on customers, processes and human capital. A minimum of five measures for each is required, and comparison with the previous two years must be shown. Figures for



investment in intellectual capital must be shown and compared with the previous two years. A narrative should accompany each set of figures. Information for investors about intellectual capital, both current and future, should occupy at least one third of the report. Where relevant, information must also be provided regarding care for the environment.

In India, there are very few companies like BHEL, Infosys and Reliance Industries, which have implemented HRA and some are working on it. Infosys, which started showing human resource as an asset in its balance sheet, has been reaping high market valuations. NIIT has been following a similar method called Economic Value Addition (EVA), which also helps in assessing the real value that an employee can fetch for the company.

Experts point out those companies can derive many benefits by going in for HRA. Not only can they measure the return on capital employed on total organisational assets (including the human assets), but the resources can also be planned accordingly. Once organisations realise the actual benefit and take it as a growth process, it will only help them in increasing their shareholders' value. When a company is able to assess an individual's worth, it helps in increasing its own worth. Basically HRA can be tracked through two methods-cost-based analysis and value-based analysis. The cost-based approach focuses on the cost parameters, which may relate to historical cost, replacement cost, or opportunity cost. The value-based approach suggests that the value of human resources depends upon their capacity to generate revenue. This approach can be further sub-divided into two broad categories: non-monetary and monetary. The disposition of resources can also be examined by allocating relative human asset values to different job grades. HRA also helps in examining expenditure on personnel and in re-appraisal of expenditure on services and training. It can also serve as a key factor in case of mergers and takeover decisions, where the human asset value becomes a relevant factor. Another very significant role, which HRA can help in creating, is goodwill for a company. The company can project itself in having best practices with superior policies in place. Experts believe that this may help the organisation attract more investments.

### **The Deterrents:**

While HRA as a concept has been present in India for more than a decade, with BHEL taking a lead, it is only now that the awareness is being translated into application. However, in terms of awareness and acceptance, the level is still low as many companies take little initiative to make the numbers public to shareholders, despite having the data. Another major deterrent is the lack of an industry standard. This means that every company has to evolve its own standard which can become a tedious process, considering that most of them are still involved in improving their business. Industry bodies like ASSCOM can help set a standard.

Another aspect working against the acceptance of HRA is the need for extensive research that it entails. Many companies do not want to go into the intricacies of finding the value of their human resources. Naresh Taneja, the head of human resources of HCL Technologies



(Mumbai, formerly Gulf Computers), believes that one cannot totally rely on this concept. "Considering the dynamism of this industry, it is very difficult to predict as to what is going to be your future requirements and how technology is going to shape in the near future. This only raises the question on the benefits of HRA."

However, it's ultimately the people who deliver results. Realising the benefits, which it can provide, the responsibility lies on the companies, as to how much importance can they or do they give to their HR.

### **Limitations of Human Resource Accounting:**

Human Resource Accounting is the term used to describe the accounting methods, system and techniques, which coupled with special knowledge and ability, assist personnel management in the valuation of personnel in financial terms. It presumes that there is great difference among the personnel in their knowledge, ability and motivation in the same organization as well as from organization to organization. It means that some become liability too instead of being human assets. There are many limitations which make the management reluctant to introduce HRA.

### **Some of the attributes are:**

1. There is no proper clear-cut and specific procedure or guidelines for finding cost and value of human resources of an organization. The systems which are being adopted have certain drawbacks.
2. The period of existence of human resource is uncertain and hence valuing them under uncertainty in future seems to be unrealistic.
3. There is a fear that HRA may dehumanize and manipulate employees. For e.g., an employee with a comparatively low value may feel discouraged and develop a complex which itself will affect his competency to work.
4. The much needed empirical evidence is yet to be found to support the hypothesis that HRA as a tool of the management facilitates better and effective management of human resources.
5. In what form and manner, their value to be included in the financial statement is the question yet to be classified on which there is no consensus in the accounting profession.
6. As human resources are not capable of being owned, retained and utilized, unlike the physical assets, there is problem for the management to treat them as assets in the strict sense.
7. There is constant fear of opposition from the trade unions as placing a value on employees would make them claim rewards and compensations based on such valuation.
8. Another question is, on value being placed on human resources how should it be amortized. Is the rate of amortization to be decreasing, constant or increasing? Should it be the same or different for different categories of personnel?



9. In spite of all its significance and necessity, tax laws do not recognize human beings as assets.
10. There is no universally accepted method of human asset valuation. As far as our country is concerned human resource accounting is still at the developmental stage.

### **Conclusion:**

Human resource accounting provides information about the value of human assets, which helps the top management to take decisions regarding the adequacy of human resources. The concept of human resource accounting is yet to gain momentum in India. For the betterment of the organizations, it is necessary to evaluate the worth of human resources in a systematic manner and record the information related to them in the financial statement of the organization to communicate their worth time to time to the users of the financial statement. When proper valuation and accounting of the human resources is not done, then the management may not be able to recognize the negative effects of certain profits in the short run. If not recognized on time, these programmes could lead to a fall in productivity levels, high turnover rate and low morale of existing employees. The HRA concept itself represents a new way of thinking about people as assets. It has a great potential for future organization to understand the value of human forces and the same should be mentioned in the financial statements.

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## The Role of Principals and Leadership Styles

Prof.Mali Archana Jayant,  
Mamasaheb Mohol College,  
Paud Road,Pune-38

### **Abstract**

*Leadership plays an important role in the process of business management. Leadership envisages the idea of influence. Leadership is not domination. It is mutual relationship based on reciprocity of leaders and lead. Without followers, leadership can't exist. It is activity of influencing people to make efforts for the attainment of certain common goals. It is only the leadership of management that guides, inspires and directs organization members for achieving common purposes. With good leadership comes goods organization; and with good organization, there is successful operation. Leadership is a human characteristic that lifts a man's vision to higher sights. It arises a man's performance to higher standards and builds man's personality beyond its normal limitations. Leadership is a great quality and it can create and convert anything. It is an important aspect of managing. It is the quality of leadership that usually determines the failure or success of business enterprise.*

Different types of leadership styles exist in work environments. Advantages and disadvantages exist within each leadership style. The culture and goals of an organization determine which leadership style fits the firm best. Some offices offer several leadership styles within the organization, dependent upon the necessary tasks to complete and departmental needs.

*The Principal is part of a Divisional Administrative Team whose function is to support and assist the schools in meeting the overall objectives of the Division and the needs of individual students.*

*The role of the Principal is to provide leadership, direction and co-ordination within the school. So he has to use various leadership styles for doing his day to day activities. According to the nature of work, he will use the leadership styles. The styles of leaderships and nature or duties of work of the principal are mentioned in the said paper.*

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## The Role of Principals and Leadership Styles

### Introduction

The Principal is part of a Divisional Administrative Team whose function is to support and assist the schools in meeting the overall objectives of the Division and the needs of individual students.

The role of the Principal is to provide leadership, direction and co-ordination within the school.

The Principal's main focus should be to develop and maintain effective educational programs within his/her school and to promote the improvement of teaching and learning with his/her school. The Principal should strive to create an organization and or climate which foster student and teacher growth. In fulfilling this role the Principal shall work under the supervision of the Superintendent of Schools and within the provisions of the Public Schools Act, the Department of Education and Training regulations, and Board Policy. Leadership style is the manner and approach of providing direction, implementing plans, and motivating people. As seen by the employees, it includes the total pattern of explicit

and implicit actions performed by their leader (Newstrom, Davis, 1993).

The first major study of leadership styles was performed in 1939 by Kurt Lewin who led a group of researchers to identify different styles of leadership (Lewin, Lippit, White, 1939). This early study has remained quite influential as it established the three major leadership styles: (U.S. Army, 1973):

### Meaning

'Leadership is one of the means of direction. Leadership can induce the subordinates to deliver their best performance in achieving the fixed organizational goals'.

### Definitions

#### 1. Alford and Batty

"Leadership is the ability to secure desirable actions from the group of followers voluntarily, without the use of coercion."

#### 2. Koontz and O'Donnell

"Leadership is influencing people to follow and to work willingly or the advancement of a common goal."

### Hypothesis

1. Principal should be the good team player and he has to work in group.
2. Principal is the head of whole school or college.

## The Role of Principals and Leadership Styles

### Objectives

1. To understand duties of a principal
2. To understand which leadership style should a principal can use and which leadership style can be more effective to run the administration of a school or college.

### Leadership Styles

Leadership style means the behavior pattern exhibited by a leader while influencing the people. Leadership styles are classified into three broad categories on the basis of the use of power by the leaders.

### Authoritarian or Autocratic Leadership

I want both of you to. . .

This style is used when leaders tell their employees what they want done and how they want it accomplished, without getting the advice of their followers. Some of the appropriate conditions to use this style is when you have all the information to solve the problem, you are short on time, and/or your employees are well motivated.

Some people tend to think of this style as a vehicle for yelling, using demeaning language, and leading by threats. This is not the authoritarian style, rather it is an abusive,

unprofessional style called "bossing people around." It has absolutely no place in a leader's repertoire.

The authoritarian style should normally only be used on rare occasions. If you have the time and want to gain more commitment and motivation from your employees, then you should use the participative style.

### Participative or Democratic Leadership

Let's work together to solve this. . .

This style involves the leader including one or more employees in the decision making process (determining what to do and how to do it). However, the leader maintains the final decision making authority. Using this style is not a sign of weakness; rather it is a sign of strength that your employees will respect.

This is normally used when you have part of the information, and your employees have other parts. A leader is not expected to know everything—this is why you employ knowledgeable and skilled people. Using this style is of mutual benefit as it allows them to become part of the team and allows you to make better decisions.

Even if you have all the answers, gaining different perspectives and

## The Role of Principals and Leadership Styles

diversity of opinions normally provide greater creativity than insularity. As Katherine Phillips wrote, So as you think about diversity and its effects in organizations during this tough economic time recognize that the most robust practical value of diversity is that it challenges everyone in an organization. We are more thoughtful, and we recognize and utilize more of the information that we have at our disposal, when diversity is present. That is diversity's true value.

### Delegative or Laissez-faire Leadership

You two take care of the problem while I go. . .

In this style, the leader allows the employees to make the decisions. However, the leader is still responsible for the decisions that are made. This is used when employees are able to analyze the situation and determine what needs to be done and how to do it. You cannot do everything! You must set priorities and delegate certain tasks.

This is not a style to use so that you can blame others when things go wrong, rather this is a style to be used when you fully trust and have confidence in the people below you. Do

not be afraid to use it, however, use it wisely!

### Forces

A good leader uses all three styles, depending on what forces are involved between the followers, the leader, and the situation. Some examples include:

- Using an authoritarian style on a new employee who is just learning the job. The leader is competent and a good coach. The employee is motivated to learn a new skill. The situation is a new environment for the employee.
- Using a participative style with a team of workers who know their jobs. The leader knows the problem, but does not have all the information. The employees know their jobs and want to become part of the team.
- Using a delegative style with a worker who knows more about the job than you. You cannot do everything and the employee needs to take ownership of her job! In addition, this allows you to be more productive.
- Using all three: Telling your employees that a procedure is not working correctly and a new one must be established (authoritarian). Asking for their ideas and input on creating a new procedure (participative). Delegating tasks in order to implement the new procedure (delegative).

## The Role of Principals and Leadership Styles

Forces that influence the style to use

- Amount of time available
- Are relationships based on respect and trust or on disrespect?
- Who has the information—you, the employees, or both?
- How well your employees are trained and how well you know the task
- Internal conflicts
- Stress levels.
- Type of task, such as structured, unstructured, complicated, or simple?
- Laws or established procedures, such as OSHA or training plans

### Role and Duties of Principals

The duties of the School Principal are all encompassing as all aspects of the schools operations are either directly or indirectly under his/her jurisdiction. In general terms of the Principal shall be responsible for:

- (a) The detailed organization of the school;
- (b) The development of the instructional program;
- (c) The assignment of duties to and the supervision of members of his staff and:

(d) The general operation of the school facility.

The amount of time a Principal will be able to devote to administrative duties will vary according to the size and grade level of the school, the amount of time released from teaching, and the demands of a particular year. However the following are all included in the powers and responsibilities of the Principal.

### 1. Leadership and Climate

- a) Continually endeavour to improve the operating effectiveness of the school for which he is responsible.
- b) Keep informed of current practices and techniques relating to school programs, teaching and administration by attending meetings and professional development conferences, and reading professional materials.
- c) When not involved in teaching duties, to devote as much time as possible to the supervision of the school; observing methods of instruction and endeavouring to improve the efficiency of the staff and the school in general. Keep the Superintendent fully advised as to the conditions and needs of the school.
- d) Suggest appropriate changes in and ensure adherence to approved policies,

## The Role of Principals and Leadership Styles

practices and procedures within his area of responsibility.

### 2. Programming

a) Co-ordinate and foster the development of programs within the school to best meet the needs and interests of the students. This includes the establishment, supervision, and evaluation of special education programs where a child needs one.

b) Assist the teaching staff in the development, implementation, modifications, and selection of curriculum materials, and keep the Superintendent informed as to any modifications in or substitution of approved courses.

c) Develop and support a high degree of student morale through curricular and extracurricular activities and services and co-ordinate the participation of all members of the teaching staff in the extracurricular program.

### 3. School Organization and Staffing

a) Participate with the School Division Office in the selection of professional, clerical and support staff.

b) Be responsible for the preparation of timetable, class lists and schedules, and

supervision schedules and be responsible for their functioning.

c) Hold regular staff meetings for the purpose of discussing educational and administrative matters.

d) Be responsible for the proper registration and transfer of students in the school and for the maintenance of up-to-date student cumulative records.

e) Maintain or direct the maintenance of other records and files, and the preparation and submission of reports as required.

f) Establish appropriate procedures for the control of all school textbooks, materials, equipment, etc.

g) Have authority over Faculty of Education Students accepted at his/her school.

h) Where there is no Vice-Principal, designate a member of the teaching staff of that school to assume the duties and responsibilities of the Principal in the Principal's absence and inform the staff of the person designated.

### 4. Professional Development

a) Promote the professional and academic growth of his staff through staff meetings, in-service training and personal contact.



## The Role of Principals and Leadership Styles

b) Take an active role in the selection, planning, and implementation of professional development activities for the staff in cooperation with the Superintendent's Office and the Division's professional development committee.

### 5. Staff Supervision and Evaluation

a) As building administrator the Principal is responsible for the daily supervision of the school, its students, facilitators, professional and support staff, volunteers, and personnel from outside agencies.

b) See that every teacher shall be on duty in the school at least 10 minutes before the opening of the forenoon session, and at least five minutes before the opening of the afternoon session.

c) Shall evaluate the effectiveness of each member of the staff in accordance with the establishment plan and shall forward written reports to the Superintendent.

d) Be responsible for the development and conduct of an orientation program for all teachers new to his staff.

e) See that instructions are prepared for the guidance of substitute teachers.

### 6. Student Control and Supervision

a) Establish a climate in which students can develop self-discipline.

b) To have disciplinary authority over each student while on school premises, while going to and from school, while riding on school buses and while taking part in authorized school activities.

c) To have authority over activities sponsored and conducted by the student organizations of his school.

d) Be responsible for the provision of supervision of students and student activities in the school buildings, on school grounds, while loading or unloading from school buses, or involved in field trips or other student activities sponsored by the school.

e) Work cooperatively with outside agencies such as Community Health Services, Children's Aid Society, Child Care and Development Services, R.C.M.P., etc.

f) Responsibility to refer to the Public Health Nurse, any child who appears to have a communicable disease or to be in need of attention for other health reasons.

g) The Principal shall be present with Police Officers if they interview pupils in the school.

## The Role of Principals and Leadership Styles

h) See that no pupil is allowed to leave the school grounds on errands without his/her express permission.

### 7. Student Evaluation and Reporting

a) To familiarize himself with the general pupil's progress and to assist in its improvement.

b) To Co-ordinate and direct the evaluation of student's progress and achievements and the provision of regular reports to parents as required by Board Policy.

### 8. Communication and Public Relations

a) Maintain communications with parents or guardians regarding the total school program, student achievement, placement and behaviour.

b) Inform parents of the school activities through newsletters, information nights, parent/teacher conferences, etc.

### 9. Budgeting and Buying

a) Be responsible for the administration of the instructional supplies budget for school and the safe keeping of monies or materials that belong to the school or the school division. Establish procedures for the purpose and receipt of materials and supplies necessary to support the instructional program. Ensure that there

is a system of accounting for monies from student activities, student fees, gifts or other funds belonging to school or to any student group within the school.

### 10. Health, Safety, Plant Supervision

a) Develop and foster a sense of pride and respect for school property so that the facility is an attractive place.

b) Ensure that all reasonable precautions are taken to safeguard the health and general well being of his staff and pupils of his school. To this end he shall see that pupils and staff are adequately trained to make effective any plans necessary for their safety.

c) Establish procedures whereby the access of visitors to the school can be monitored and controlled. This would include access by salespersons, guest speakers and former students.

d) Organize and supervise patrols where applicable, make readily available first aid supplies and treatment.

e) Inspect the school grounds and school buildings to see that they are free from hazards which might cause accidents and he shall notify the proper authorities of any conditions which need to be remedied.

### The Role of Principals and Leadership Styles

f) In the event of where damage is serious and appears to have been deliberate, it shall be reported to the police department in addition to the Division Office.

g) Report any accidents or injuries of students or staff to the Superintendent's Office on the forms provided.

h) Conduct fire drills as required by regulations and see that all personnel within the school are familiar with all procedures to be followed in case of a fire. Fire exit signs shall be placed in each room.

i) Establish effective controls governing the use of any medication, pain killers (aspirin, etc.) by students in the school.

j) Assume responsibility for the general cleanliness and maintenance of his school.

k) Be responsible for the direction of the work of Caretaker in the routine cleaning of the school premises. If difficulties arise, they shall be reported through the Secretary-Treasurer.

l) Work with the Secretary-Treasurer in the planning of capital projects and the routine maintenance of school buildings and grounds.

m) The Principal shall control use to be made of school buildings and grounds in accordance with Board Policy.

#### Suggestions

1. The principal will have to use Participative Leadership Style.

2. The principal has to adopt authorities & responsibilities also.

3. The principal will have to take suggestions from various staff members.

#### Conclusions

The principal uses the various leadership styles according to the nature of work. He can use Autocratic leadership style when there will be a major problem. He will generally use Democratic leadership styles. He is not generally using laissez faire leadership style, because he will have to handle all the staff, students as well as management also.

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# ISPTS-2

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## 214. Al<sub>2</sub>O<sub>3</sub> MODIFIED ZnO COMPOSITE THICK FILM FOR ETHANOL GAS SENSING

Sapana Rane<sup>a,b</sup>, Shubhangi Awate<sup>c</sup>, Govind Umargi<sup>c</sup>, S. S. Arbuj<sup>c</sup>, S. B. Rane<sup>c</sup>, and S. W. Gosavi<sup>d</sup>

<sup>a</sup>Department of Electronics, Mamasahab Mohol College, Paud Road, Pune-411038, India <sup>b</sup>Department of Electronic Science, Savitribai Phule Pune University, Pune-411007,

India Email: [spna\\_rane@rediffmail.com](mailto:spna_rane@rediffmail.com)

<sup>c</sup>Centre for Materials for Electronics Technology, Off. Pashan Road, Pune-411008, India

Email: [sunitrane@yahoo.com](mailto:sunitrane@yahoo.com)

<sup>d</sup>Department of Physics, Savitribai Phule Pune University, Pune-411007, India

Email: [swg@physics.unipune.ac.in](mailto:swg@physics.unipune.ac.in)

**Keywords:** Ethanol sensor, ZnO, thick film, gas sensor

### ABSTRACT

Chemical sensors have gained the importance since past decade for applications household as well as industrial applications includes homeland security, medical and environmental monitoring and also food safety. A desirable goal is the ability to simultaneously analyze a wide variety of environmental and biological gases and liquids and able to selectively detect the target analyte with high specificity and sensitivity. The gas sensor based on semiconductor materials has been extensively used to detect and monitor variety of gases and vapours. The conductance of these semiconductors changes significantly when the gas molecules are adsorbed and desorbed at the surface of semiconductors, which can modulate the carrier density and mobility of the material. Thick film gas sensors based on semiconducting metal oxides are the most investigated groups of gas sensors due to their low cost and flexibility in production, simplicity of their use and large number of detectable gases. ZnO is an interesting, chemically more stable semiconductor material having band gap of 3.4 eV and an oxygen containing surface for bio and chemical sensors. It has an ability to operate in harsh environments and possesses a combination of attractive and unique optical, piezoelectrical, sensing and magnetic properties and therefore being a prospective material in the area of physical as well as chemical sensors. ZnO-related gas sensing involves the chemisorptions of oxygen on the oxide surface, followed by charge transfer during the reaction between chemisorbed oxygen and target gas molecules, changing the surface resistance of the sensor element. Pure ZnO films have a lower stability in corrosive, humid ambient due to large amount of oxygen vacancy. The properties of such zinc oxide films are often altered by adsorption of O<sub>2</sub> and water (H<sub>2</sub>O). Also thermal instability is another factor limiting the application of pure ZnO. To overcome these disadvantage/limitations, the properties of ZnO films are controlled by appropriate doping either by cationic (Al, In) or anionic (F) substitution.

The aim of the present work to develop thick film ethanol sensor based on ZnO by modifying with Al<sub>2</sub>O<sub>3</sub> to improve its stability and sensing performance. Ethanol is exclusively utilized for beverages, industrial and scientific sectors. Ethanol is a hypnotic (sleep producer) gas having toxic nature. Heavy exposure and/or consumption of alcoholic beverages, particularly by smokers, increase the risk of cancer of the upper respiratory and digestive tracks. Alcoholic cirrhosis leads to liver cancer. Amongst the women, the chances of breast cancer increase with alcoholic consumption or exposure. Those working on ethanol synthesis have great chances of being victims of respiratory and digestive track cancer. So there is a great demanded emerging challenge for monitoring ethanol gas at trace level.

Thick film sensor with comb like structure was prepared on 96 % alumina substrate. The functional material was prepared by mixing of ZnO and Al<sub>2</sub>O<sub>3</sub> powders in Agate mortar and pestle with acetone medium which was subsequently sintered at 500° C for two hours and then cooled normally. The same was used as functional materials for the formulation of thick film paste. Thick film paste was



prepared by mixing of appropriate amount prepared powder of modified ZnO, glass frit and an organic vehicle in the agate pestle mortar. Figure 1 shows the FESEM micrograph of the of the modified ZnO powder. The planar sensor structure was prepared by screen-printing technique. Pre-fired thick film silver electrodes were used for electrical contacts. The screen printed sensing film was dried and fired at 550<sup>o</sup> C in thick film firing furnace at 60 firing profile.

The fabricated sensor film was placed in the static gas chamber having inbuilt heater arrangement. Different concentrations of ethanol were injected through syringe and the change in resistance was measured. Figure 2 shows the thick film sensor film mounted in the gas sensing measurement system. The capacity of the gas chamber was 6.3 Lt. The sensor response was defined as the ratio of ( $S = R_a/R_g$ ) of the resistance of the sensor in air to that in target gas. The sensor shows highest response at given at 274<sup>o</sup>C and beyond this temperature the sensor response decrease. This is the operating temperature of the sensor. The sensor response increases linearly with the concentration of ethanol (Figure 3). The response and recovery time of the sensor was 6 sec and 16 sec respectively observed which is shown in figure 4.

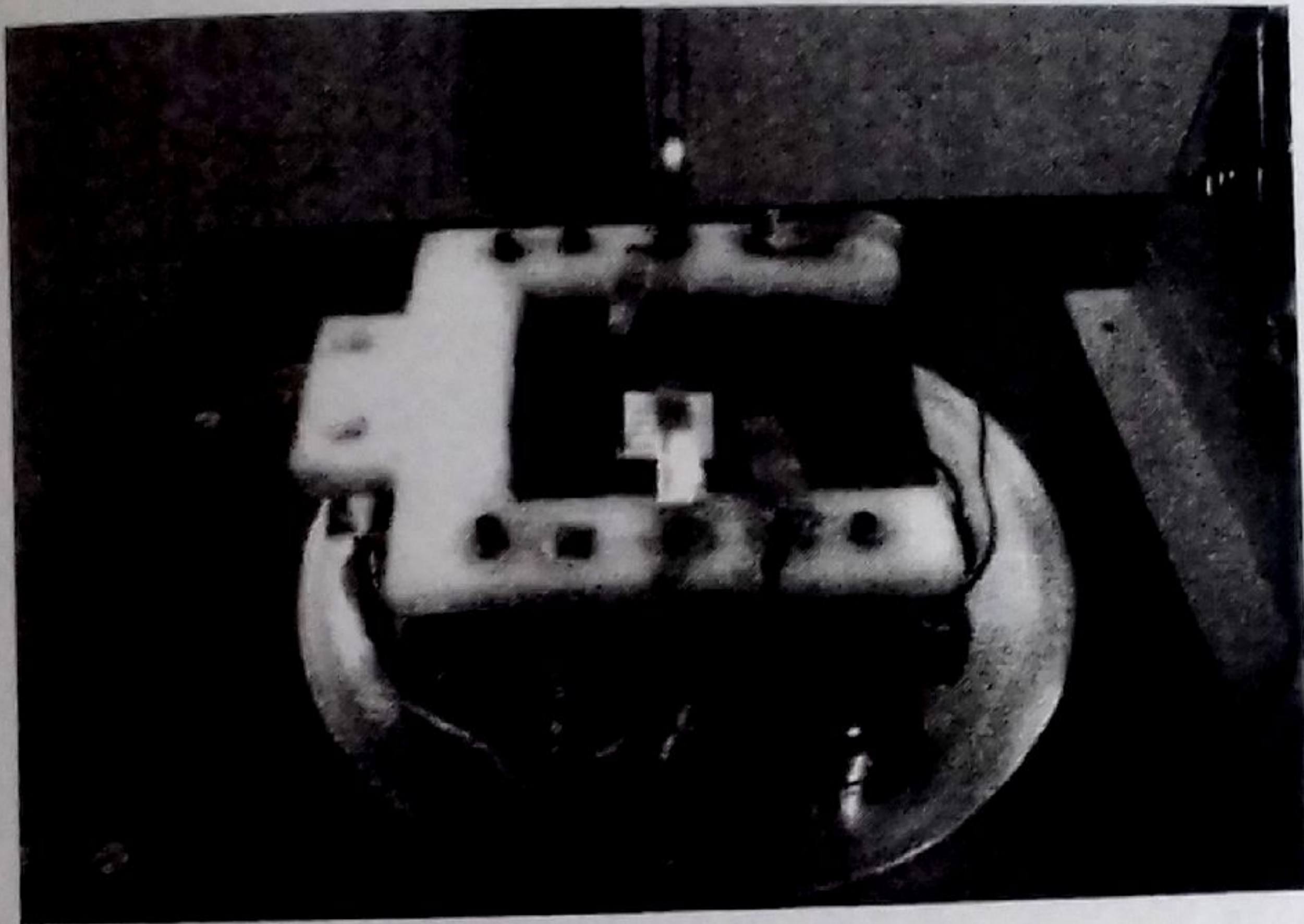


Figure 2: Thick film sensor mounted in the gas Chamber Setup



Figure 1: FESEM of functional sensing material

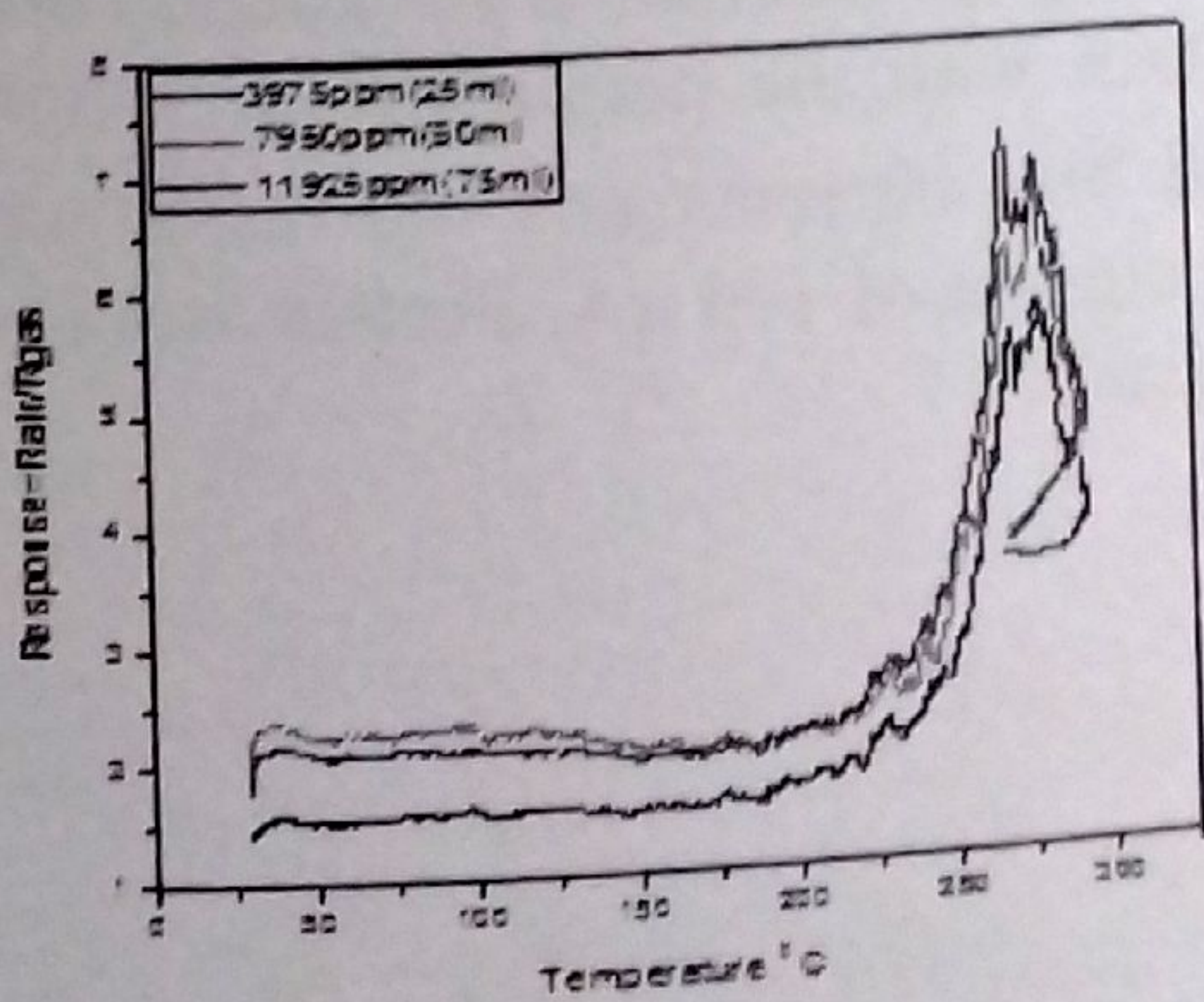


Figure 3: Sensing response as a function of temperature for different concentration of ethanol.

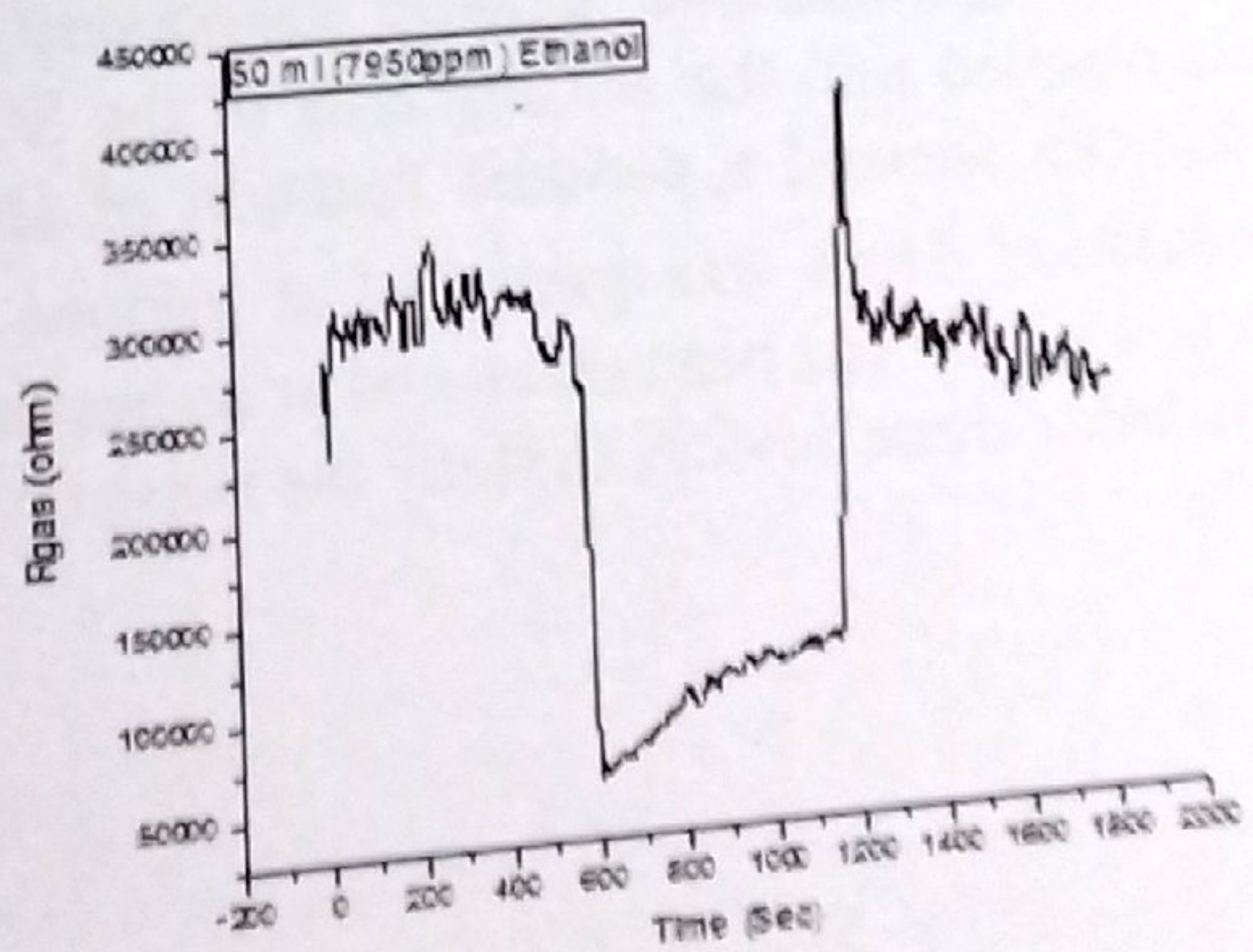


Figure 2: Response and recovery time of sensor



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# INDEX

Sr. No.	TITLE OF THE PAPER	PAGE No.
1	Invited Talk by Dr. Anand Karve	1-2
2	Invited Talk by Dr. Arvind Shaligram	3-6
3	Invited Talk by Dr. Prakash Wadgaonkar	7
4	Invited Talk by. Dr. G. S. Chinchankar	8
5	Electronic Waste Management	9-17
6	Energy Consumption in wired Communication Media in computer Network	18-19
7	Smart Traffic Signal To Reduce Pollution And Fuel Wastage Due To Idling Of Vehicles At Intersection	20-23
8	Needs and Challenges to develop Smart cities and homes	24-26
9	Municipal Solid Waste management for urban cities in India - a case of Pune city	27-31
10	Laser Based Optoelectronic System For Monitoring The Undulatory Movement Of Larvas Under Different Thermal Environmental Condition	32-33
11	Case study of Green Computing and its Quality Dimensions	34-37
12	Ag-ZnO One Dimensional Nanostructures as Ammonia Gas Sensors	38-39
13	Dielectric Parameters of Herbal Medicines	40-43
14	Solvothermal Synthesis of Ni doped SnO <sub>2</sub> Nanostructures and its Photocatalytic Applications	44-45
15	Agricultural Infrastructure based Energy Resources	46-48
16	Traffic Surveillance System-a proposed model	49-57
17	Development of Low Cost Wireless Sensor Network for Automatic Field Monitoring With Arduino Controller	58-60
18	Use of computer simulation software for teaching and learning the electronic science practical course, help to reduces e-waste.	61-64
19	A Review: Detection of Geopathic Stress Zone Using Ancient and Modern Techniques	65-68
20	A scientific study about recent trends, challenges and opportunities in Green Technology: Retrospection and Aspirations	69-73
21	EVM: Electronic Voting Machine	74-79
22	Smart Power Management System Using Internet of Things	80-83
23	E-waste management	84-87
24	Dynamic reconfigurable wireless sensor network technology-issues and challenges	88-91
25	Effect of fungicides on pollen grain germination of Datura and Hibiscus	92-95
26	Isolation and characterization of chitosan producing bacteria from soil samples obtained from river banks and lakes near Pune	96-99
27	Generation of MDR Due To Untreated Hospital Effluent	100-102
28	Isolation, characterization and identification of micro-organisms and biodegradation of 2,4-dichlorophenoxyacetic acid	103-106



# Ag-ZnO One Dimensional Nanostructures as Ammonia Gas Sensors

Sapana Rane<sup>1,2</sup>, Nitin Adhav<sup>3</sup>, Sudhir Arbuji<sup>3</sup>, Sunit Rane<sup>3</sup>, Suresh Gosavi<sup>4</sup>

<sup>1</sup>Department of Electronics, Mamasheh Mohol College, Paud Road, Pune-411038

<sup>2</sup>Department of Electronic Science, Savitribai Phule Pune University, Pune-411007

<sup>3</sup>Materials for Renewable Energy Division, Centre for Materials for Electronics Technology, Off Pashan Road, Panchwati, Pune-411007, India

<sup>4</sup>Department of Physics, Savitribai Phule Pune University, Pune-411007

Email: sapana.rane@yahoo.com<sup>1</sup>, swg@physics.unipune.ac.in<sup>4</sup>

**Abstract-** In the present study, we have synthesized one dimensional (1D) ZnO nanostructures using simple semi-solvothermal reaction technique. To this prepared 1D ZnO nanostructures we have loaded 1 and 5 mol% Ag nanoparticles. The prepared Ag-ZnO nanostructures were characterized with different spectroscopic techniques and studied for Ammonia detection.

**Index Term-** One Dimensional, ZnO, sensor, nanomaterials

## 1. INTRODUCTION

Gas sensors based on semiconductor metal oxide (e.g. tin oxide, zinc oxide, titanium oxide etc) are commonly used for industrial applications and environmental monitoring as they are cost effective and ease of operation. Zinc Oxide (ZnO) is one of the interest of material being considered for gas sensing application for various gases including ethanol, H<sub>2</sub>, CO, H<sub>2</sub>S, NH<sub>3</sub> etc due to its high chemical stability, low cost and short response time. However, gas sensors based on ZnO was found to be limited by low sensitivity and high working temperature that restricts the use of ZnO. But considering the versatility of the material significant efforts are being taken to overcome the stated limitations to improve the sensing performance by developing hybrids such as semiconductor-semiconductor and metal-semiconductor material. The deposition of noble metal nano particles viz. Au, Ag, Pd etc on to metal oxide nanostructures has been demonstrated to improve the sensor performance. In this regard we have synthesized Ag-ZnO nanostructures and studied its sensor properties.

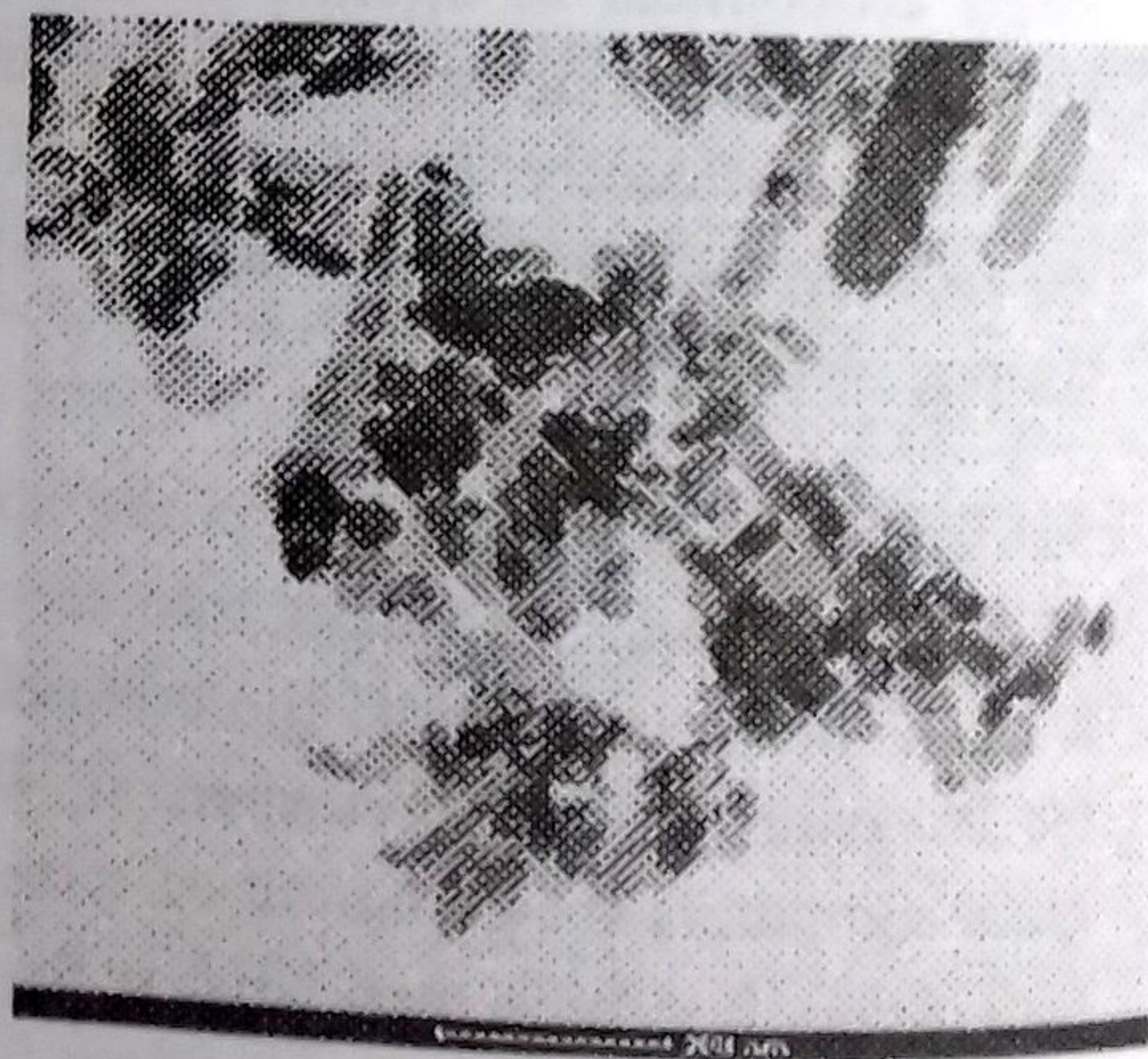
## 2. EXPERIMENTAL

Ag-ZnO nanostructures were synthesized using solvothermal reaction technique at 200 °C for 24 h. The prepared nanostructures were characterized with XRD, UV-Visible and PL spectroscopy, FE-SEM and TEM analysis techniques. The prepared nanostructures are used to detect the NH<sub>3</sub> gas with

different ppm concentrations using the in-house developed gas sensing set up.

## 3. RESULTS AND DISCUSSION

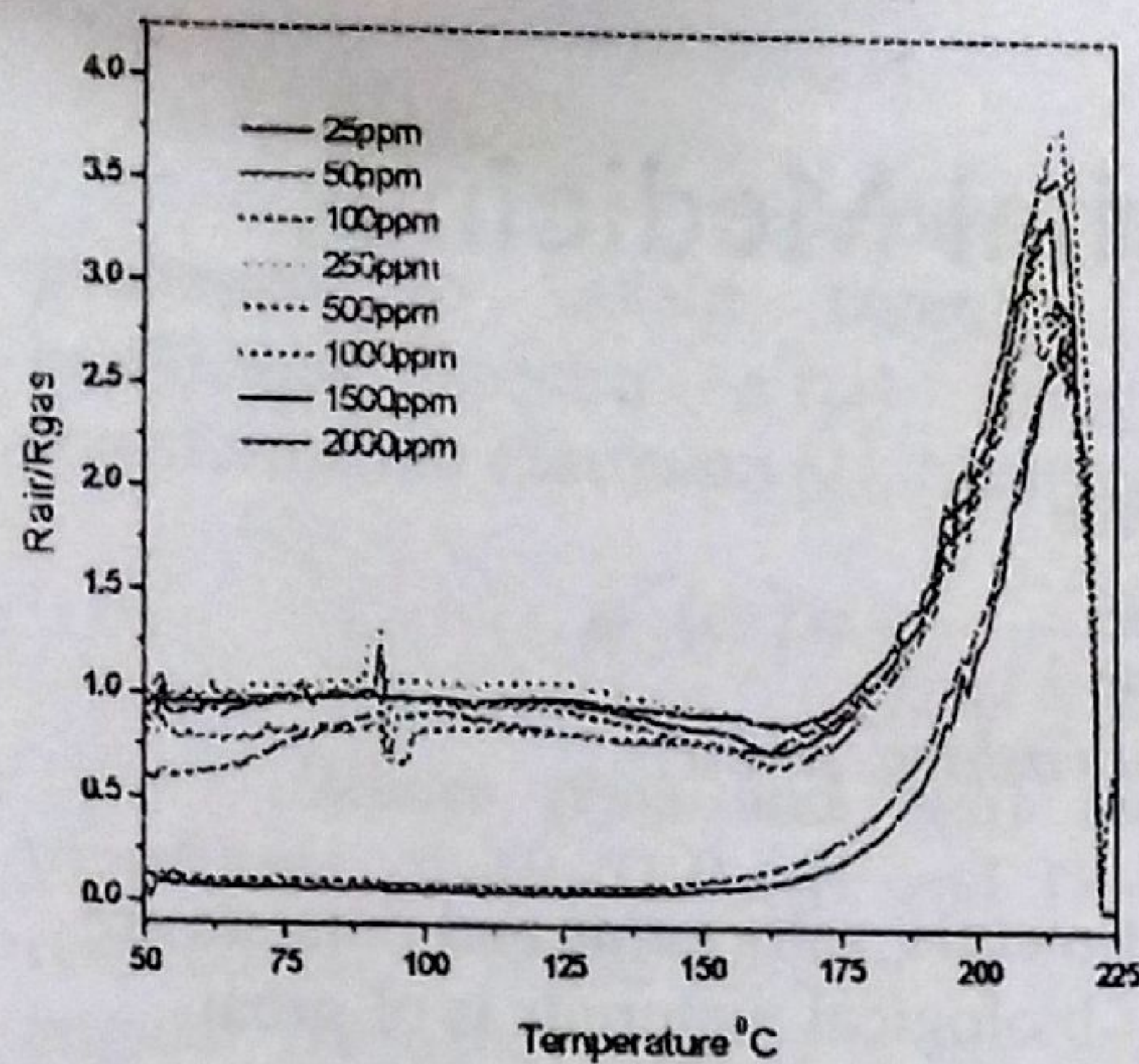
XRD peak indicate the formation of crystalline hexagonal phase of ZnO. UV-visible analysis depicts the absorbance peak at 370 nm corresponds to band gap of 3.35eV.



**Fig. 1** TEM of 5 mol% Ag-ZnO nanostructures

FE-SEM analysis confirms the formation of rod like morphology having diameter in the range of 20 to 30 nm and length around 200 to 500 nm respectively. TEM validate the presence of Ag nanoparticles on ZnO nanorods (Fig. 1). Figure 2 shows the sensor response to NH<sub>3</sub> gas with respect to temperature for the Ag loaded ZnO thick film sensor.





**Fig. 2** Ammonia sensing using 5mol %Ag-ZnO nanostructures

### CONCLUSIONS:

We have successfully synthesized the 1D Ag-ZnO nanostructures and studied for  $\text{NH}_3$  sensing application.

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# INDEX

Sr. No.	TITLE OF THE PAPER	PAGE No.
1	Invited Talk by Dr. Anand Karve	1-2
2	Invited Talk by Dr. Arvind Shaligram	3-6
3	Invited Talk by Dr. Prakash Wadgaonkar	7
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6	Energy Consumption in wired Communication Media in computer Network	18-19
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9	Municipal Solid Waste management for urban cities in India - a case of Pune city	27-31
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11	Case study of Green Computing and its Quality Dimensions	34-37
12	Ag-ZnO One Dimensional Nanostructures as Ammonia Gas Sensors	38-39
13	Dielectric Parameters of Herbal Medicines	40-43
14	Solvothermal Synthesis of Ni doped SnO <sub>2</sub> Nanostructures and its Photocatalytic Applications	44-45
15	Agricultural Infrastructure based Energy Resources	46-48
16	Traffic Surveillance System-a proposed model	49-57
17	Development of Low Cost Wireless Sensor Network for Automatic Field Monitoring With Arduino Controller	58-60
18	Use of computer simulation software for teaching and learning the electronic science practical course, help to reduces e-waste.	61-64
19	A Review: Detection of Geopathic Stress Zone Using Ancient and Modern Techniques	65-68
20	A scientific study about recent trends, challenges and opportunities in Green Technology: Retrospection and Aspirations	69-73
21	EVM: Electronic Voting Machine	74-79
22	Smart Power Management System Using Internet of Things	80-83
23	E-waste management	84-87
24	Dynamic reconfigurable wireless sensor network technology-issues and challenges	88-91
25	Effect of fungicides on pollen grain germination of Datura and Hibiscus	92-95
26	Isolation and characterization of chitosan producing bacteria from soil samples obtained from river banks and lakes near Pune	96-99
27	Generation of MDR Due To Untreated Hospital Effluent	100-102
28	Isolation, characterization and identification of micro-organisms and biodegradation of 2,4-dichlorophenoxyacetic acid	103-108



# Solvothermal Synthesis of Ni doped SnO<sub>2</sub> Nanostructures and its Photocatalytic Applications

Nitin Adhav<sup>1</sup>, Sapana Rane<sup>2,3</sup>, Sachin Arbut<sup>1</sup>, Suresh Gosavi<sup>4</sup>, Sunit Rane<sup>1</sup>

<sup>1</sup>Centre for Materials Electronics Technology, Off Pashan Road, Panchavati, Pune-411008

<sup>2</sup>Department of Electronics, Mamasahab Mohol College, Paud Road, Pune-411038

<sup>3</sup>Department of Electronic Science, Savitribai Phule Pune University, Pune-411007

<sup>4</sup>Department of Physics, Savitribai Phule Pune University, Pune-411007

Email: [sunit.rane@mahce.com](mailto:sunit.rane@mahce.com)

**Abstract:** The Ni doped SnO<sub>2</sub> nanostructures were synthesized using solvothermal reaction techniques. The prepared nanomaterials were characterized with different spectroscopic techniques. XRD indicates the formation of tetragonal phase. FE-SEM and TEM validates the formation of nanosized Ni<sub>x</sub>Sn<sub>1-x</sub>O<sub>2</sub> having size around 4 to 5 nm.

**Index Term-** Photocatalysis, dye degradation, nanomaterials

## 1. INTRODUCTION

Nowadays industries are growing tremendously in order to fulfill the human requirements at the same time on the other hand this growth results in an increase of environment pollution particular to air and water pollution. Therefore there is urgent need to develop the technology to identify the gaseous pollutants and decompose the same into the eco-friendly substances. To address this issue, semiconductor oxide materials have potential to identify the pollutants and decompose it using green energy such as solar light. The use of semiconductor oxide materials in presence of light decomposes the pollutants present in air and water, this technique is called as photocatalysis. SnO<sub>2</sub> is the wide band gap semiconductor and having capability to decompose volatile organic compounds and hazardous gases too. The doping of particular transition metal also enhances the selectivity for particular gas sensing and visible light active photocatalysis. In this regard we proposed the synthesis of Ni doped SnO<sub>2</sub> nanostructures which can be selectively used for gas sensing applications as well as environmental abatement using photocatalysis.

## 2. EXPERIMENTAL

Synthesis of Ni doped SnO<sub>2</sub> nanostructures with doping concentration ranging from 0.01 to 0.5 moles were carried out using solvothermal reaction technique. For this purpose we used SnCl<sub>4</sub>, NiCl<sub>2</sub> and ethylenediamine and methanol. The prepared

nanostructure was characterized with XRD, UV-Vis, PL, and FE-SEM and TEM techniques. The

photocatalytic activity of prepared samples was investigated with aqueous methylene blue degradation.

## 3. RESULTS AND DISCUSSION

The broad and intense reflection peaks of XRD depicts the formation of nanosized Ni doped SnO<sub>2</sub> having tetragonal phase in all the prepared compositions (Fig. 1). FE-SEM analysis validates its spherical morphology having evenly distributed particles with size in the range of 4 to 5 nm.

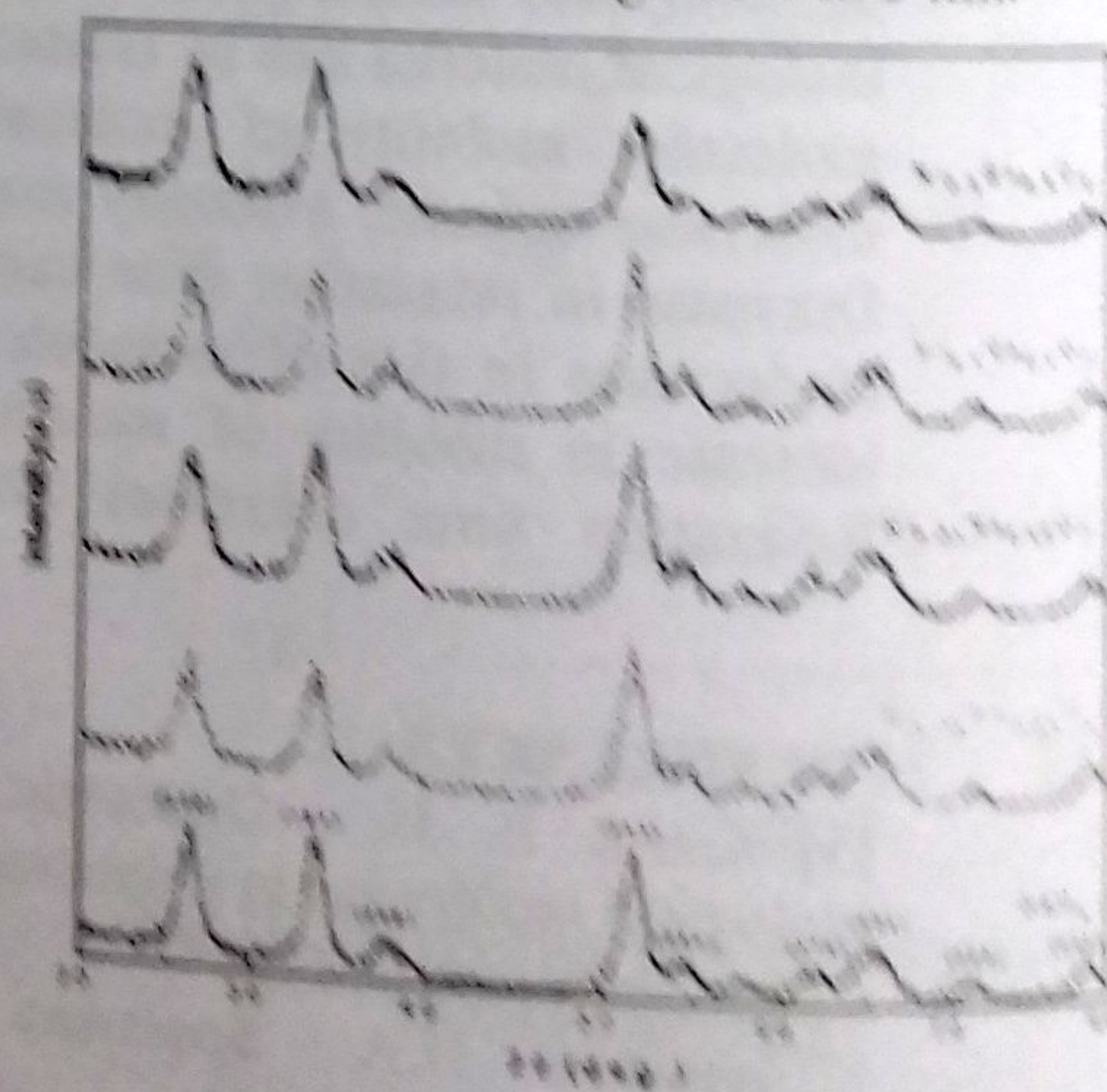


Fig. 1 XRD pattern of Ni<sub>x</sub>Sn<sub>1-x</sub>O<sub>2</sub> nanostructures



The PL study indicates the single emission peak at 367 nm confirms the formation of defect free  $\text{Ni}_x\text{Sn}_{1-x}\text{O}_2$  nanostructures. The photocatalytic activity of prepared samples was found to be less as compared to pure  $\text{SnO}_2$ . This might be because of generation of defects which acts as recombination centre for formed electron-hole pairs. The increase of Ni doping  $\text{SnO}_2$  results decrease in photocatalytic activity.

### CONCLUSIONS:

The Ni doped  $\text{SnO}_2$  with different mol% were successfully synthesized using solvothermal reaction route. The XRD confirms the crystalline tetragonal phase of prepared nanostructures. FE-SEM and TEM validate the formation of spherical shaped nanostructures having size 4-5 nm. The Ni doping might be acting as a recombination centres due to which the photocatalytic activity of

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