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Criteria 3- Research, Innovations and Extension

Key Indicator 3.3- Research Publication and Awards

3.3.1. Number of research papers published per teacher in the Journals notified on UGC care list during the last five years.

2019-20			
Sl.No.	**Name of the Title**	**Name of the Faculty**	**Department**
01	Structural, Thermal and Morphology Studies of Cu-CoZnFe2O4 Nano Ferrites by Combustion Method	Dr. Madhukumar R	Physics
02	DESIGN AND CONSTRUCTION OF DIGITAL LASER COMBUSTION INSTRUMENT AND SYNTHESIS OF SILVER NANOPARTICLES (AgNPs)	Dr.Madhukumar R	Physics
03	Money and Banking International Trade and Public Finance in India	Ramesh N G	Economics
04	Future Roles and Challenges of Library Professionals in Academic Libraries.	Dr.PANDAPPA. B. KOPPAD	LIBRARY SCIENCE

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Structural, Thermal and Morphology Studies of Cu-$CoZnFe_2O_4$ Nano Ferrites by Combustion Method

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Abstract: A detailed investigation on the effect of preparation method on the structural, thermal and morphology Cu-Co ferrite nanoparticles prepared by solution combustion method. The resulting ferrites were calcined at 450°C and 750°C. Sharper X-ray diffraction (XRD) peaks were observed for the samples calcined at 750°C, indicating greater crystallinity of the samples calcined at higher temperature. Average crystallite sizes fell in the ranges of 30.4–42.1 nm for the samples calcined at 450°C and 750°C, respectively. Agglomeration of particles was observed in the scanning electron microscopy (SEM) images. Cumulative acidity decreased for the samples calcined at higher temperature. The results underline the effect of preparation conditions on the morphology, crystallite size, and magnetic properties of nano ferrites. The thermal properties such as onset of decomposition and glass transition temperatures were determined by Thermo Gravimetric Analysis (TGA/DSC). The TGA data shows that nanoferrites have significantly enhanced thermal stability. Thermal studies on as prepared samples have been undertaken over a wide range of decomposition at room temperature to up to 1000°C.

Keywords: Cu-$CoZnFe_2O_4$ nano ferrites; XRD; SEM; DSC/TGA

1. Introduction

Nanotechnology, shortened to "nanotech", is the study of controlling matter on an atomic and molecular scale. Generally, nanotechnology deals with structures of the size 100 nanometers or smaller in at least one dimension, and involves developing materials or devices within that size. Nanotechnology is very diverse, ranging from extensions of conventional device physics to completely new approaches based upon molecular self-assembly, from developing new materials with dimensions on the nanoscale to investigating whether we can directly control matter on the atomic scale.

Nanotechnology has the potential to create many new materials and devices with a vast range of applications, such as in medicine, electronics and energy production. On the other hand, nanotechnology raises many of the same issues as with any introduction of new technology, including concerns about the toxicity and environmental impact of nanomaterials and their potential effects on global economics.[1,2]

Materials reduced to the nanoscale can show different properties compared to what they exhibit on a macroscale, enabling unique applications. The nanotechnology can offer the following: opaque substances become transparent (Cu); stable materials turn combustible (Al); insoluble materials become soluble (Au). A material such as gold, which is chemically inert at normal scales, can serve as a potent chemical catalyst at nanoscales. Much of the fascination with nanotechnology stems from these quantum and surface phenomena that matter exhibits at the nanoscale. The application of cobalt ferrite is a kind of drug delivery system, cobalt modified for recording materials, magnetic materials, and light spin filter.[3] These properties and suitability have made the cobalt ferrite one of the most highly studied magnetic materials. The general nature of the spinel ferrite nanoparticles is that their properties can be changed to meet the requirements by varying the synthesis process, precursor pH, catalyst ion substitution, annealing conditions, agglomeration, and the like.[4] In spinel ferrite, nickel-copper-cobalt ferrite has mixed spinel structure and belongs to the cubic system. It is a magnetic recording material with good performance. In the field of material science, magnetic materials have become a subject of considerable interest in the field of power storage devices. Especially in magnetic data storage, magnetic fluid technology, magnetic targeting drug delivery, magnetic resonance imaging has important applications.[5] Nickel-Copper-cobalt ferrite also has high magnetic anisotropy, high coercivity, high resistivity and good magnetic spectrum properties. Meanwhile, this ferrite is not easy to wear and corrosion and it has good performance in high frequency and ultra-high frequency applications. More and more researchers are improving the magnetic properties of spinel ferrite by doping and substitution.[6,7]

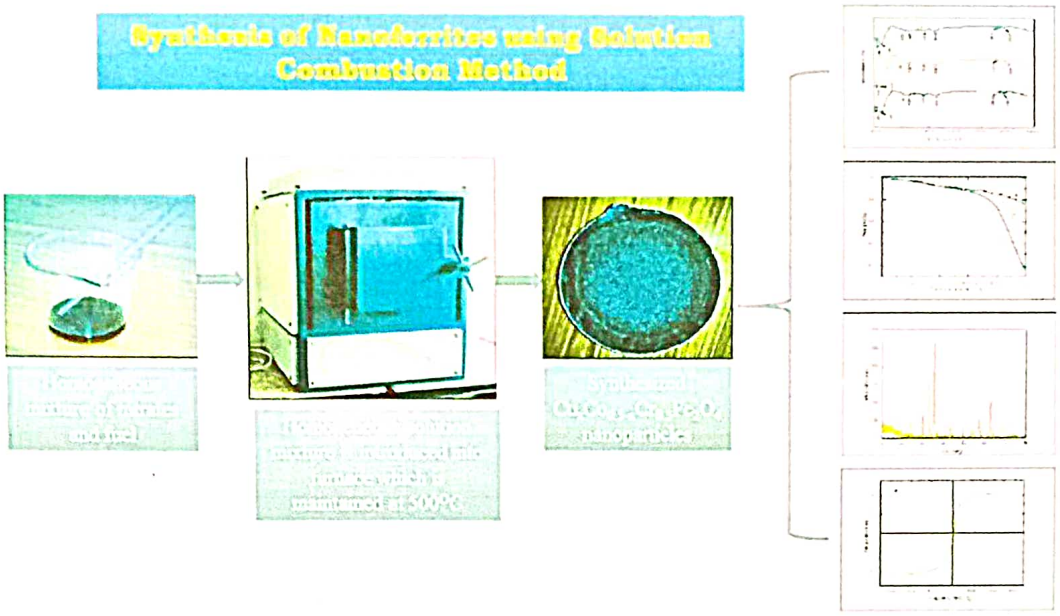

Fig. 1. Schematic Illustration for the Preparation of Cu-$CoZnFe_2O_4$

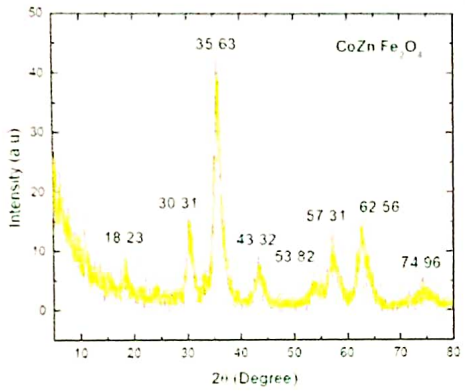

Fig. 2. XRD Pattern of $CoZnFe_2O_4$ nanoferrites.

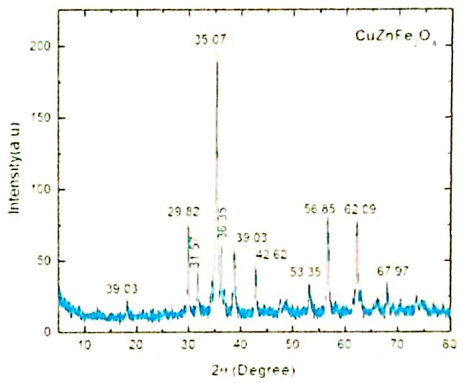

Fig. 3. XRD Pattern of $CuZnFe_2O_4$ nanoferrites.

2. Experimental Section

2.1. Materials

All chemicals and reagents used for synthesis were of analytical grade. Cobalt nitrate $\{Co(No_3)_2.6H_2O\}$, Zinc nitrate $\{Zn(No_3)_2.6H_2O\}$, Ferric nitrate $\{Fe(No_3)_3.9H_2O\}$, Urea NH_2CONH_2, HCl (37%) were purchased from Thomas Baker chem. Pvt. Ltd. India and used directly without further purification.

2.1.1. Synthesis of Cu-$CoZnFe_2O_4$ Nanocomposites

The Cu-$CoZnFe_2O_4$ nanocomposites have been prepared by solution combustion method (Fig. 1). The stoichiometric amounts of cobalt nitrate, zinc nitrate and ferric nitrate as oxidizers and urea as a fuel were dissolved in distilled water to prepare homogeneous aqueous solution. The above solution containing redox mixture is heated in a muffle furnace maintained at around 600°C and 500°C till complete combustion. The mixture finally yields porous and voluminous powder containing Cu-$CoZnFe_2O_4$ nanocomposites.

The X-ray diffraction patterns of the synthesized samples were recorded using Panalytical X-Pert Pro MPD instrument.

The morphological analysis of the synthesized samples was performed using the FESEM CARL ZEISS instrument.

The thermal properties of prepared nanocomposite samples were studied using a TA-STD Q600 instrument under dry nitrogen.

Atmosphere at the flow rate of 100mL/min. The samples were heated from room temperature to 700°C at predetermined rate of 20°C/ min.

3. Results and Discussions

3.1. X-Ray Diffraction Studies on prepared Cu-$CoZnFe_2O_4$ Nano Ferrites

Structural analysis of the $CuZnFe_2O_4$ and $CoZnFe_2O_4$ Nano Ferrites samples has been performed using the powder XRD patterns and is presented in Figs. 2 & 3. The XRD peaks (111), (022), (113), (222), (004), (224), (333), and (044) indicate that the prepared sample has a Single-phase spinel cubic structure. The other prepared samples have

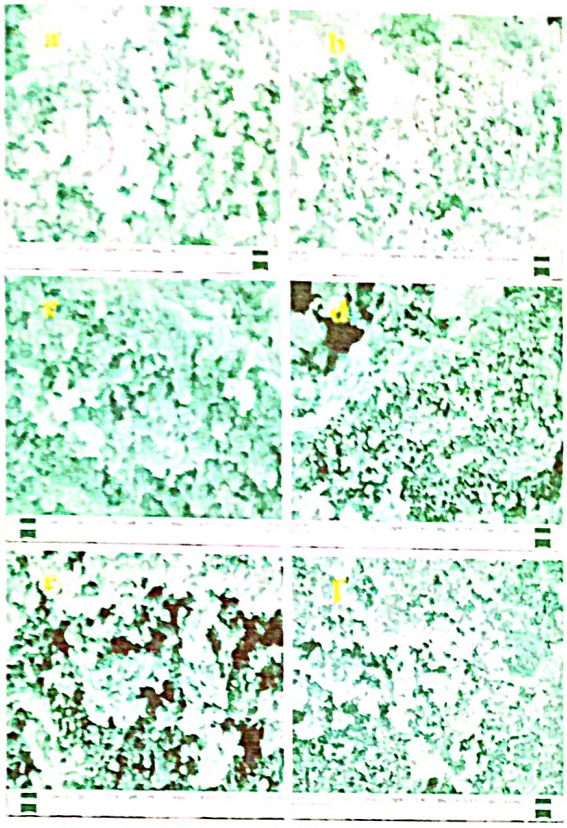

Fig. 4. FESEM images of Cu-$CoZnFe_2O_4$ nano ferrites.

partial formation of secondary hematite phase with spinel-phase cubic structure. In the reported literature, it has been found that the Co-Zn ferrite nanoparticles prepared using a sol gel method and annealed below 600°C have single-phase Figs. 2 and 3 shows the XRD spectra of $CuZnFe_2O_4$ and $CoZnFe_2O_4$ nano ferrites spinel structure.[8-10] The diffraction peaks have good agreement with standard (JCPDS card nos. 52-0277 and 89-0599) corresponding to the spinel Co-Zn ferrite and secondary hematite phase, respectively. The peak intensity of secondary hematite phase and it also found that secondary phase diminished at high concentration of cobalt doping. The average crystallite size of all prepared samples was calculated from full width at half maximum (FWHM) of most prominent peak (113) of XRD patterns using Scherer's.[11,12] $D = 0.9\lambda/\beta \cos\theta$ where D is the average crystallite size, β is the FWHM of the peak intensity measured in radians, λ = 1.54 °A is the wavelength of X-ray, and θ is Bragg's angle. It is found that crystallite size (D) increases with cobalt doping from 25 to 31 nm. The crystallite size (D) obtained at x = 0.5% (28 nm) and x = 0.5% (30 nm) is nearly the same. Also, other calculated structural parameters at x = 0.03 and 0.09 possess approximately the same values by virtue of this small dopant variation. Hence, the calculated crystallite size (D). The effect of Co doping on structural parameters includes d spacing (d) and lattice constant (a) that have been calculated using the following relations: $2d \sin\theta = n\lambda$.[13,14]

3.1.1. FE-SEM Studies on Cu-$CoZnFe_2O_4$ Nano Ferrites

Fig. 4 shows the SEM images of $CuZnFe_2O_4$ and $CoZnFe_2O_4$ Nano Ferrites synthesized powder dried at 900°C in vacuum (Fig. 4a) and calcined at 5000°C for 45 min (Fig. 4b), respectively. In Fig. 4a, it is

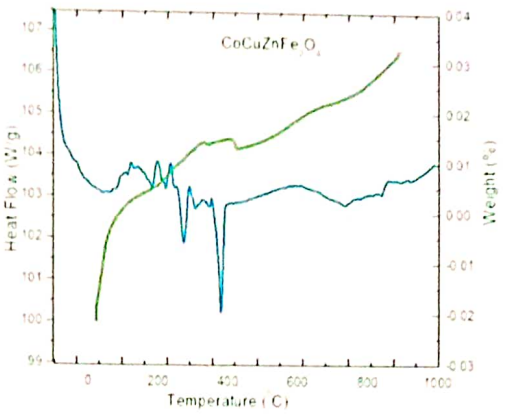

Fig. 5. DSC/TGA thermographs of Cu-$CoZnFe_2O_4$ nano ferrites.

seen that agglomeration of crystals takes place. Usually, agglomeration is formed by smaller size of crystals. There are very large number of spherical crystals with much smaller size i.e., nanometer dimensions below 100 nm. This agrees well with XRD pattern where peak broadening appeared for these powder specimens. The fine particles and their agglomerates are clearly seen in the SEM image.[15,16]

However, after the heat treatment at 500°C, the crystal size increases and the grain size was measured from SEM micrograph (Fig. 4b). This value is in agreement with the results obtained from XRD data where sharp peaks are the indication of well define crystallization of $CuZnFe_2O_4$ and $CoZnFe_2O_4$ Nano Ferrites. The XRD peaks are very narrow indicating the higher grain size falls beyond the nano-scale region. SEM microstructures of $CuZnFe_2O_4$ and $CoZnFe_2O_4$ Nano Ferrites specimens sintered at 500°C are shown in Fig. 4c–d, respectively. The effect of heat treatment (500°C) on specimens morphology are very obvious from the low resolution micrographs, the specimens have small grains (Fig. 4c). The effect of these partial melting causes dramatic changes in impedance results.[17-19]

3.1.2. DSC/TGA Studies on Cu-$CoZnFe_2O_4$ Nano Ferrites

Fig. 5 shows the DSC/TGA curve of $CuCoZnFe_2O_4$ Nano Ferrites. The DSC/DTG curve shows that there were about initial 10% weight loss at lower temperature (less than 100°C) due to the vaporization of water in the $CuZnFe_2O_4$ and $CoZnFe_2O_4$ Nano Ferrites. The weight change was not significant and the sample was thermally stable.

In the second step there is a weight loss of about 50% in the temperature range 100 to 450°C, which is ascribed to the degradation of the polymer chains and larger weight loss (about 68%) at the temperature between 500-800°C. The decomposition temperature of the $CuCoZnFe_2O_4$ Nano Ferrites was found to depend on the amount of $CuCoZnFe_2O_4$ Nano Ferrites present in the composite.[20,22]

4. Conclusions

The present study demonstrated the structural, chemical and thermal properties of $CuZnFe_2O_4$ and $CoZnFe_2O_4$ Nano Ferrites

synthesized using a solution combustion method. Significant results obtained are summarized below:

As-prepared samples were examined by using XRD, FT-IR, FE-SEM and DSC analysis techniques. XRD study revealed that samples have single phase spinel cubic structure. There is partial formation of secondary hematite phase (α-Fe_2O_3) with spinel phase cubic structure of $CuZnFe_2O_4$ and $CoZnFe_2O_4$ Nano Ferrites. The crystallite size (D) increases with Co and Cu because of larger ionic radii of Co^{2+} ions as compared to Cu^{2+} ions. The crystallinity of prepared samples increases and has been investigated by FESEM. Thermal stability of the samples was analyzed using TGA.

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Conflicts of Interest

The authors declare no conflict of interest.

References

1 Sulabha K. Kulkarni. Nanotechnology: Principles and practice, 3rd ed; Springer Cham Heidelberg New York Dordrecht London, 2015; 273-317; 978-3-319-09170-9. [Link]

2 Muneeswaran M.; Gopiraman M.; Giridharan N. V. Optical, Electrical and Magnetic Properties of Dy-Substitution on $Bifeo_3$ Nanoparticles. *Nano Prog.*, 2019, **1**, 16-21. [CrossRef]

3 Bhasker S.U.; Reddy M.V.R. Effect of Chromium Substitution on Structural, Magnetic and Electrical Properties of Magneto-Ceramic Cobalt Ferrite Nano-Particles. *J. Sol-gel Sci. Technol.*, 2015, **73**, 396-402. [CrossRef]

4 Uday Bhasker S. Preparation and Characterization of Cobalt Magnesium Nano Ferrites using Auto-Combustion Method. *Adv. Mater. Res.*, 2012, **584**, 280-284. [CrossRef]

5 Rahimi-Nasrabadi M.; Behpour M.; Sobhani-Nasab A.; Jeddy M.R. Nanocrystalline Ce-Doped Copper Ferrite: Synthesis, Characterization, and its Photocatalyst Application. *J. Mater. Sci. Mater. Electron.*, 2016, **27**, 11691-11697. [CrossRef]

6 Osborne M.D.; Fleet M.E.; Bancroft G.M. Next-Nearest Neighbor Effects in the Mössbauer Spectra of (Cr, Al) Spinels. *J. Solid State Chem.*, 1984, **53**, 174-183. [CrossRef]

7 Zhang C.F.; Zhong X.C.; Yu H.Y.; Liu Z.W.; Zeng D.C. Effects of Cobalt Doping on the Microstructure and Magnetic Properties of Mn–Zn Ferrites Prepared by the Co-Precipitation Method. *Physica B: Condens. Matter*, 2009, **404**, 2327-2331. [CrossRef]

8 Manikandan A.; Kennedy L.J.; Bououdina, M.; Vijaya J.J. Synthesis, Optical and Magnetic Properties of Pure and Co-Doped $ZnFe_2O_4$ Nanoparticles by Microwave Combustion Method. *J. Magn. Magn. Mater.*, 2014, **349**, 249-258. [CrossRef]

9 Barbes V.A.M. Chapter 3: Progress in Spinel Ferrite Research. Handbook of Magnetic Materials. 1995, **8**, 189-324. [CrossRef]

10 Brockman F.G.; Dowling P.H.; Steneck W.G. Anomalous Behavior of the Dielectric Constant of a Ferromagnetic Ferrite at the Magnetic Curie Point. *Phys. Rev.*, 1949, **75**, 1440. [CrossRef]

11 Alley R.E.; Schnettler F.J. Effect of Cross-Section Area and Compression upon the Relaxation in Permeability for Toroidal Samples of Ferrites. *J. Appl. Phys.*, 1953, **24**, 1524-1525. [CrossRef]

12 Gul I.H.; Maqsood A. Structural, Magnetic and Electrical Properties of Cobalt Ferrites Prepared by the Sol–Gel Route. *J. Alloys Compds.*, 2008, **465**, 227-231. [CrossRef]

13 Hankare P.P.; Pandav R.S.; Patil R.P.; Vader V.T.; Garadkar K.M. Synthesis, Structural and Magnetic Properties of Copper Substituted Nickel Manganite. *J. Alloys Compd.*, 2012, **544**, 197-202. [CrossRef]

14 Raghavender A.T.; Damir Pajic.; Kreso Zadro.; Tomislav Milekovic.; Venkateshwara rao P.; Jadhav K.M.; Ravinder D. Synthesis and Magnetic Properties of $Nife_2$–$Xalxo_4$ Nanoparticles. *J. Magn. Magn. Mater.*, 2007, **316**, 1-7. [CrossRef]

15 Rennard R.J.; Khel W.L. Oxidative Dehydrogenation of Butenes over Ferrite Catalysts. *J. Catal.*, 1971, **21**, 282-293. [CrossRef]

16 Rezlescu N.; Rezlescu E. Dielectric Properties of Copper Containing Ferrites. *Phys. Status Solidi* (a), 1974, **23**, 575-582. [CrossRef]

17 Shitre A.R.; Kawade V.B.; Bichile G.K.; Jadhav K.M. X-ray Diffraction and Dielectric Study of $Co_{1-x}Cd_xFe_{2-x}Cr_xO_4$ Ferrite System. *Mater. Lett.*, 2002, **56**, 188-193. [CrossRef]

18 Sousa E.C. ; Alves C.R. ; Aquino R.; Sousa M.H.; Goya G.F.; Rechenberg, H.R.; Tourincho F.A.; Depeyrot J. Experimental Evidence of Surface Effects in the Magnetic Dynamics Behavior of Ferrite Nanoparticles. *J. Magn. Magn. Mater.*, 2005, **289**, 118-121. [CrossRef]

19 Smit J.; Wijn H.P.J Ferrites: Physical Properties of Ferromagnetic Oxides in Relation to their Technical Applications (Eindhoven: Phillips), 1959.

20 Koops C.G. On the Dispersion of Resistivity and Dielectric Constant of Some Semiconductors at Audiofrequencies. *Phys. Rev.*, 1951, **83**, 121. [CrossRef]

21 Yuan C.L.; Hong Y.S.; Lin C.H. Synthesis and Characterization of Sr (ZnZr) x Fe_{12}– $2xO_{19}$–PANI Composites. *J. Magn. Magn. Mater.*, 2011, **323**, 1851-1854. [CrossRef]

22 Prasanna G.D.; Ashok R.L.; Prasad V.B.; Jayanna H.S. Synthesis and Characterization of Magnetic and Conductive Nickel Ferrite–Polyaniline Nanocomposites. *J. Compos. Mater.*, 2015, **49**, 2649. [CrossRef]

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DESIGN AND CONSTRUCTION OF DIGITAL LASER COMBUSTION INSTRUMENT AND SYNTHESIS OF SILVER NANOPARTICLES (AgNPs)

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Abstract

The present work focus to the design and development of digital combustion instrument for synthesis of nanoparticles by laser combustion method. This instrument is capable of controlling the synthesis just by giving digital i/p (input), we can prepare more sample of linearly varying different physical variables with digital accuracy and it consume less time and power, sample prepared with this instrument can also be further characterized by Transmission Electron Microscope (TEM). The shape evolution and size of the formed silver nanoparticles was studied using transmission electron microscope. The captured images shown the formed particle were spherical in shape, surface morphology, and diameter in the AgNPs its range from 10 to 20 nm.

Keywords

Digital Laser Instrument, Silver Nitrate ($AgNO_3$), Hydrogels, Deionized Water (DI) and Transmission Electron Microscope (TEM)

1. Introduction

Recent years many researchers across the globe have put more effort on synthesis of nanoparticle in different method, during the synthesis process researchers need to concentrate on two factors one is to maintaining the system to control over both physical parameters and chemical parameters and another one is preparation of sample in such a way that it should be helpful for further characterization. Currently some researchers use analog method for synthesis part by manually controlling both physical and chemical parameters after that they go for digital analysis by using so many softwares but in the entire process there are chances of miss communication between analogy synthesis and digital analysis. In our work we have tried to fill the gap between synthesis part and analysis part by introducing new method called digital synthesis method. In this method we are able to prepare more sample with linearly varying physical parameter by consuming less power consumption and very less chemical within a small time and it proved helpful to further characterization so for that we are designed both software and hardware. In this work we have replaced a tradition combustion chamber for preparation of nanoparticle by introducing new digital combustion chamber and it is controlled by microcontroller just by writing a program in an arduino environment and it works as back hand,

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the software which we have developed by using visual studio acts as the lead. For combustion it requires a high temperature and for that we are using high power laser source and again it is control by an arduino microcontroller and laser driver.

1.1. Software requirements for developing instruments

- Arduino software
- Visual basics
- Autocad13

1.2. Hardware requirements

- 2 LG DVD drivers
- Arduino UNO microcontroller
- Motor driver
- 1watt LASER
- LASER driver
- 12v power supply
- Laser water cooler
- Water pump

1.3. System requirements

- Operating system windows7, windows8, windows10
- RAM 2GB
- Hard disk 32GB
- Processor 1.92GH$_z$

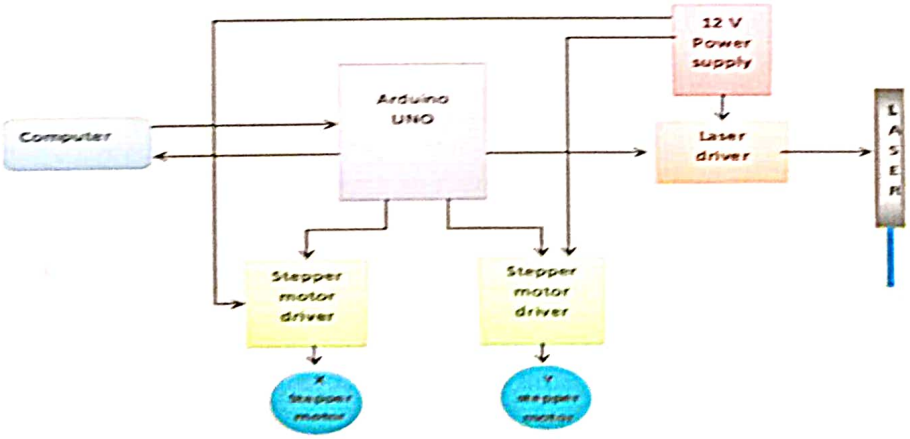

Figure 1: *Block diagram digital combustion instrument*

Money and Banking International Trade and Public Finance in India

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Abstract

Author in this paper looks at the money e minutes basic role as medium of exchange and its importance in maintaining trade and public finance in India. World trade has expanded rapidly over the past decades. An important factor contributing to the growth in trade has been the periodic rounds of successful multilateral trade negotiations which have led to a considerable reduction in tariffs on goods crossing national borders. India has entered into trading agreements with various countries of the world with the objective of boosting its external trade. Foreign Trade Policy of India has always focused on substantially increasing the country's share of global merchandise trade. Accordingly the Government of India has been taking various steps towards boosting its trade with the rest of the world by adopting policies and procedures which would help to increase and facilitate both exports and imports with the other countries of the world. To facilitate and thereby increase external trade activities with the rest of the world, the Department of Commerce, Government of India has developed this web portal.Fiscal measures are important and the government is working on a package of measures. The finance minister has gone on record on this. The government has taken measures to contain expenditure, like freeze on its employees' dearness allowance; at the same time, the government has announced a relief package to support the vulnerable and disadvantaged sections. Through measures like in-kind support (food grains), cash support, DBT (Direct Benefit Transfer) support or depositing money in PMJDY (PM Jan Dhan Yojana) accounts, government has committed to spend 0.8% of GDP. So, therefore, meeting the fiscal deficit target of 3.5% this year is going to be very challenging, and going beyond it becomes unavoidable.

Also, because of the lockdown, GST collections are going to be significantly impacted, and impact on direct taxes cannot be ruled out. While deciding on the size of the fiscal package, it would be very important to prioritise the support measures and interventions. All measures should be well targeted to optimise the outcome. Equally important is to have an exit strategy of fiscal interventions. In other words, fiscal measures under the package should contain specific sunset provisions. This would be in line with the recommendations of the FRBM Committee. In terms of exceeding the fiscal deficit, two straight replies, one is the 3.5% fiscal deficit target for this year will be very challenging to meet. As regards, how much it will exceed and how much the government will spend, that will depend on the view taken by the government, with regard to how much they can exceed the deficit number, and what kind of support measures can be taken that produce maximum impact.

Keywords— FRBM Committee, India, exit strategy, fiscal deficit, fiscal interventions

Introduction

In other words, it has to be a judicious and balanced call keeping in mind the need to support the economy on one hand and the sustainable level of fiscal deficit that is consistent with macroeconomic and financial stability.The pace at which policy rates are transmitted to financial markets determines the effectiveness of monetary policy signals. The transmission of policy rate changes to financial markets is sensitive to liquidity conditions and, therefore, the impact of policy rate changes is conditioned to a large extent by the liquidity management operations of the central bank. Under the framework where the interest rate channel has emerged as the key transmission channel for central banks, managing liquidity actively to steer the target rate in the desired trajectory has become a standard operating framework. An appraisal of the liquidity demand of the banking system becomes critical for the success of liquidity management operations.

For an efficient transmission of monetary policy, the central bank aims to align its overnight operating target rate close to its policy rate to guide the longer-term interest rates in the economy by way of liquidity provisions ranging from overnight window to medium-term horizon. Persistent deviation of the central bank's target interest rate from its policy rate may trigger active liquidity absorption or injection because such deviations and consequent rise in volatility may heighten market uncertainties and make the transmission process that much weaker. Thus, liquidity management is considered to be crucial for the first leg of monetary transmission, i.e. transmission of policy rate changes to overnight money market rate. In an emerging market economy, where financial markets are not fully developed and there are numerous frictions operating in the financial system (e.g. regulated interest rates in some segments, lack of complete market integration and prevalence of sectoral credit dispensation), the efficacy of the interest rate channel of monetary policy transmission is impeded.

Further, the efficacy of the transmission process to financial markets is also impeded by the prevalence of liquidity frictions, which may not be conducive for complete transmission of the policy rate changes. The operating framework of a monetary policy that has evolved across most advanced economies (AEs) and emerging market economies (EMEs) comprises mainly of an operating target interest rate of the central bank and instrument(s) to achieve the target rate. In the Indian context, the Reserve Bank of India (RBI, 2014) has suggested that liquidity management operations should be consistent with the stance of monetary policy, i.e. an increase in the policy rate to convey an anti-inflation policy should be accompanied by tightening of liquidity conditions, whereas accommodative liquidity conditions should characterise the easing of the policy standpoint. Thus, the transmission of monetary policy to interest rates at the short end of the yield curve is responsive to liquidity conditions prevailing during the policy rate change and subsequent periods. The central bank responds to various liquidity shocks in the banking system by deploying an array of liquidity management instruments. The basic operating framework of any monetary policy aims to align the weighted average call rate (WACR), i.e. the operating target, with the policy rate by proactively managing liquidity.

The revised liquidity framework instituted by the Reserve Bank of India (RBI) in September 2014 aimed to make liquidity management operations flexible, transparent and predictable. Subsequently, the liquidity management framework was fine-tuned to progressively lower the average ex ante liquidity deficit to a situation closer to neutrality. The objective is to meet the requirements of durable liquidity and then use the central bank's operations to ensure that short-term liquidity conditions are congruent with the monetary policy stance. Furthermore, the policy rate corridor around the repo rate was narrowed from +/-100 basis points to +/- 50 basis points. The prime motivation of this paper is to identify the unanticipated liquidity shocks that explain movements in call money rate and the pattern of its volatility. Thus, this paper seeks to answer the following question: How do various frictional and structural liquidity shocks shape the monetary transmission process towards the short- end and the nature

"User's Relationship Management in College Library"

Proceedings of

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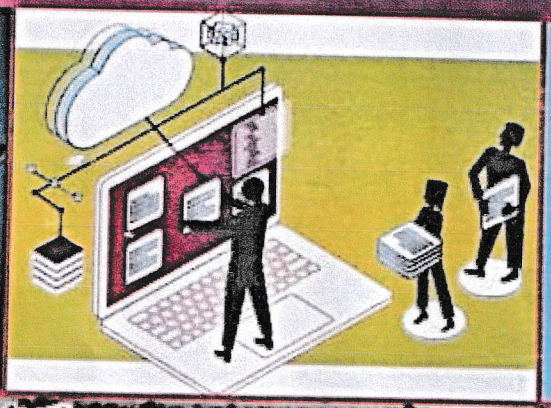

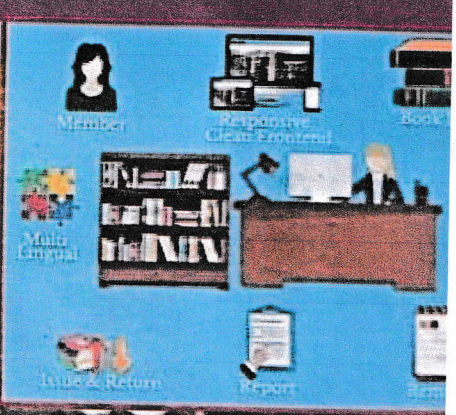

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FUTURE ROLES AND CHALLENGES OF LIBRARY PROFESSIONALS IN ACADEMIC LIBRARIES

Dr. Pandappa. B. Koppad

Abstract

Academic Libraries are facing a variety of critical challenges affecting their existence in a modern dynamic digital environment. Libraries are evolving to multimedia information gateways or portals providing access to global information resources. Academic Libraries have become complex learning resource centres with multiple roles and a variety of complex challenges.

Keywords: Digital Environment, Future Libraries

Introduction

Technology will continue to change, and libraries and librarians have to use the changing technology to provide the best access and service to their patrons. Electronic information creates challenges for the library community at its very foundation, moving it away from the traditional paper-and-print format to an ethereal world of circuits and connectivity. The library is no longer defined simply as a building or a physical repository that houses information. Hence ensuring and organizing access to educational materials in the electronic environment is an important factor in determining realistic requests for development and advancement of education.

In the face of this globalization, libraries will need to look beyond walls, campuses, and even borders. University and college libraries will be increasingly expected to open their resources to visiting students and scholars, in the process increasing the need for sensitivity to cultural differences when it comes to space as well as differing levels of proficiency in the English language. Libraries will face greater demands for access to resources, while library staffs will need multiple language skills and be asked to support more learning at a distance. Digitalization of collections will allow rapid access to, and exchange of, resources, which will raise questions of adequate bandwidth and the cost of keeping technology current. Globalization will also shape all aspects of teaching and learning. As technology increasingly infuses the curriculum, professors will be able to choose from an international array of source material from which to develop their courses, in turn placing greater demands on libraries to provide needed support services for faculty. Globalization also offers the academic library opportunities to become more effective in serving students and faculty through enhanced partnerships with libraries throughout the world, leading to more open access to knowledge and best practices that will eventually provide more supportive, streamlined services to a new generation of students.

Future Libraries in Digital Age

Technology will continue to change, and libraries and librarians have to use the changing technology to provide the best access and service to their patrons. Electronic information creates challenges for the library community at its very foundation, moving away from the traditional paper-and-print format to an ethereal world of circuits and connectivity. The library is no longer defined simply as a building or a physical repository that houses information.