Abstract-21
Investigations on CuO: ZnO composites for photocatalytic performance

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Abstract: In recent years, semiconductor photocatalysis has been established to be one of the effective strategies for solving global energy and environmental problems by effective utilization of solar energy. Here we have synthesized CuO: ZnO composites using a simple nontoxic chemical route and explored it as an effective photocatalyst for the degradation of rose Bengal (RB) and methylene blue (M.B.) dyes. The prepared CuO: ZnO composites were investigated for their structural, optical, and morphological properties using XRD analysis, UV spectroscopy, EDS, and SEM. The effect of dye concentration, photocatalyst loading dosage, pH, and degradation time under visible light irradiation has been studied. The results demonstrate that CuO: ZnO composite effectively bleached out MB and RB dyes as compared to bare CuO and ZnO.

Keywords: Copper oxide, Zinc oxide, Photocatalysis, Methylene blue, Rose Bengal, Visible light

Abstract-22
Magnetic hyperthermia with Fe_3O_4 nanoparticles

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Abstract: Biocompatibility restrictions have limited the use of magnetic nanoparticles for magnetic hyperthermia therapy to iron oxides, namely magnetite (Fe_3O_4) and maghemite (g-Fe2O3). However, there is yet another magnetic iron oxide phase that has not been considered so far, despite its unique magnetic properties: Fe_3O_4. Indeed, whereas Fe_3O_4 and g- Fe_2O_3 have a relatively low magnetic coercivity, Fe_2O_3 exhibits a giant coercivity. In this report, the heating power of Fe_2O_3 nanoparticles in comparison with g-Fe_2O_3 nanoparticles of similar size (20 nm) was measured in a wide range of field frequencies and amplitudes, in uncoated and polymer-coated samples. It was found that Fe_3O_4 nanoparticles primarily heat in the low-frequency regime (20–100 kHz) in media whose viscosity is like that of cell cytoplasm. In contrast, g- Fe_2O_3 nanoparticles heat more effectively in the high frequency range (400–900 kHz). Cell culture experiments exhibited no toxicity in a wide range of nanoparticle concentrations and a high internalization rate. In conclusion, the performance of Fe_3O_4 nanoparticles is slightly inferior to that of g-Fe2O3 nanoparticles in human magnetic hyperthermia applications. However, these Fe3O4 nanoparticles open the way for switchable magnetic heating owing to their distinct response to frequency.

Keywords: - Fe_2O_3 nanoparticles, Biocompatibility, magnetic coercivity

Abstract-23
Studies on Induced Mutation in Barnyard Millet (Echinocloa esculanta) L.

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Abstract: Induced mutation is one of the highly effective and valuable tools in plant breeding techniques. Inducing new genetic recombinant with desire traits could be successful research pure line crop. The ultimate goal of plant breeding in millet is to get maximum grain yield including biomass and the harvest index. Recently, millets have returned as a viable option to live healthy life and can reduce the incidence of lifestyle diseases viz. Diabetes, Hypertension and Cardiovascular. Barnyard Millets have many nutritional, nutraceuticals and health promoting properties especially the high fiber content. Significance of our research

work in M1 generation phenotypically different characters was noted in Barnyard Millet (Phule Barti-1) with Chemical mutagens like Ethyle Methane Sulphonate (EMS). Observed phenotypic traits are noted viz. dwarf plants, anthocyanin pigment developed plants, plants with maximum height with multiple tillers, sturdy shoot with elongated internodes, fully developed seeds in panicle with curved fingers. Ultimate aim of research work to enhance nutritional parameters with wide consuming acceptability of Barnyard Millets through induced mutation.

Keywords: EMS, Induced Mutation, Phule Barti-1, SA

Abstract-24
Determination of physicochemical parameters and adulteration of multifloral honey by FTIR-ATR spectroscopy

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Abstract: Nowadays there is increase interest towards honey origin and adulteration of pure honey. In this study, physicochemical properties like pH, moisture content, free acidity, diastase activity, reducing sugar and 5-Hydroxymethylfurfural were determined in multifloral honey samples. Natural honey samples were collected during 2020-22 from local honey collecting tribals of Karjat, Ahmednagar district, Maharashtra. Total four adulterants used like glucose, fructose, sucrose and corn syrup. Here, we emphasize the easy, accurate and precise flourier transform infrared and attenuated total reflectance (FTIR-ATR) spectroscopic method for the determination of natural honey and adulterated honey samples. FTIR spectral range of 4000 to 400 cm-1 wavenumbers, however 2934, 1642, 1740, and 800-1200 cm-1 shows predominant wavenumber. Chemometric techniques such as principal component analysis, discriminant analysis and partial least square will be planned for grouping, classification and to differentiation of adulterated honey from natural one. The FTIR-ATR technique with chemometrics provides significant result and better resolution method for detecting adulterated honey.

Keywords: Honey, Adulterants, FTIR-ATR, Physicochemical properties

Abstract-25
Ni-Ferrite an efficient catalyst for synthesis of 3-aryl substituted isoxazole-5-carboxylic acids via one-pot multicomponent reaction

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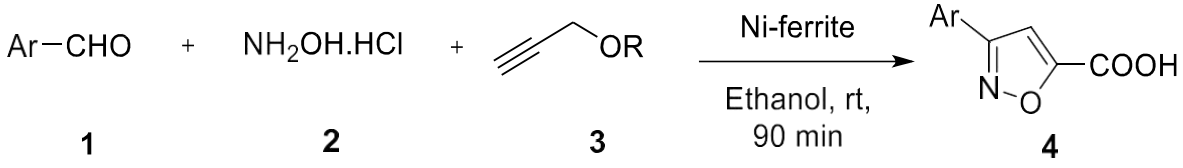
Abstract: Here, we have reported an efficient one-pot, three-component reaction between various aryl aldehydes, NH2OH.HCl and propargyl alcohol using Ni-Fe2O4 as a nanocatalyst in ethanol at room temperature to afford various 3-aryl substituted isoxazole-5-carboxylic acids in good yields. The advantage of this protocol is that it formed isoxazole derivatives with a free carboxylic acid functionality in one pot which could transform into various other functional groups. This approach has several merits, including a quick reaction time, a wide range of substrates, excellent product yields, and reusable catalysts.



Keywords: Multicomponent; Nickel Ferrites; Isoxazole; Oxidation; Carboxylic acid