

Work done through online mode (through mail, WhatsApp and E-Contents) and progress during Lock down (**From 23rd Till 28th April 2020**)

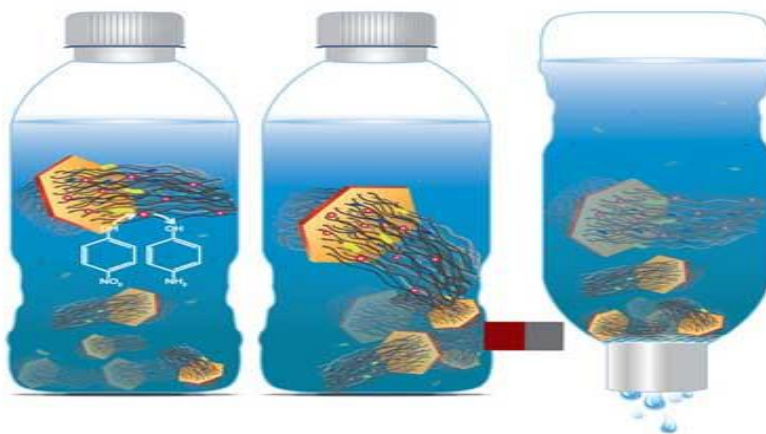
By **-Dr. Rakesh Kumar Singh**

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[A]. Details of Research Publications of M.Tech /Ph.D. scholar/Faculty work with AKU affiliation are mentioned following. The M.Tech/Ph.D. scholar are in close contact through mail/WhatsApp group/ mobile/online during lockdown. Average 2hr per academic session (total average 7 hr per day) time are being devoted of different affairs of academics of Ph.D. academic session 2018-21, Ph.D. 17-20 , M.Tech 2018-20 & 2019-21, students and research activities.

1. **Research paper related to purification of water through activated Alumina materials accepted in SCI Journal, Desalination and Water Treatment the Web of Science, SCI-E impact factor is 1.234.**



Summary off this research

Removal of fluoride is a desalination technology in which fluoride ions from aqueous solution are adsorbed on suitable adsorbent surfaces. This work aim to determine equilibrium sorption of fluoride on surface modified activated nano-alumina in aqueous solution. The adsorption potential was performed on both activated alumina as well as grinded activated alumina by batch sorption experiments for different contact time, pH, and proportion of fluoride and alumina concentrations. Results indicated that adsorption occurred rapidly in beginning, and equilibrium was reached on

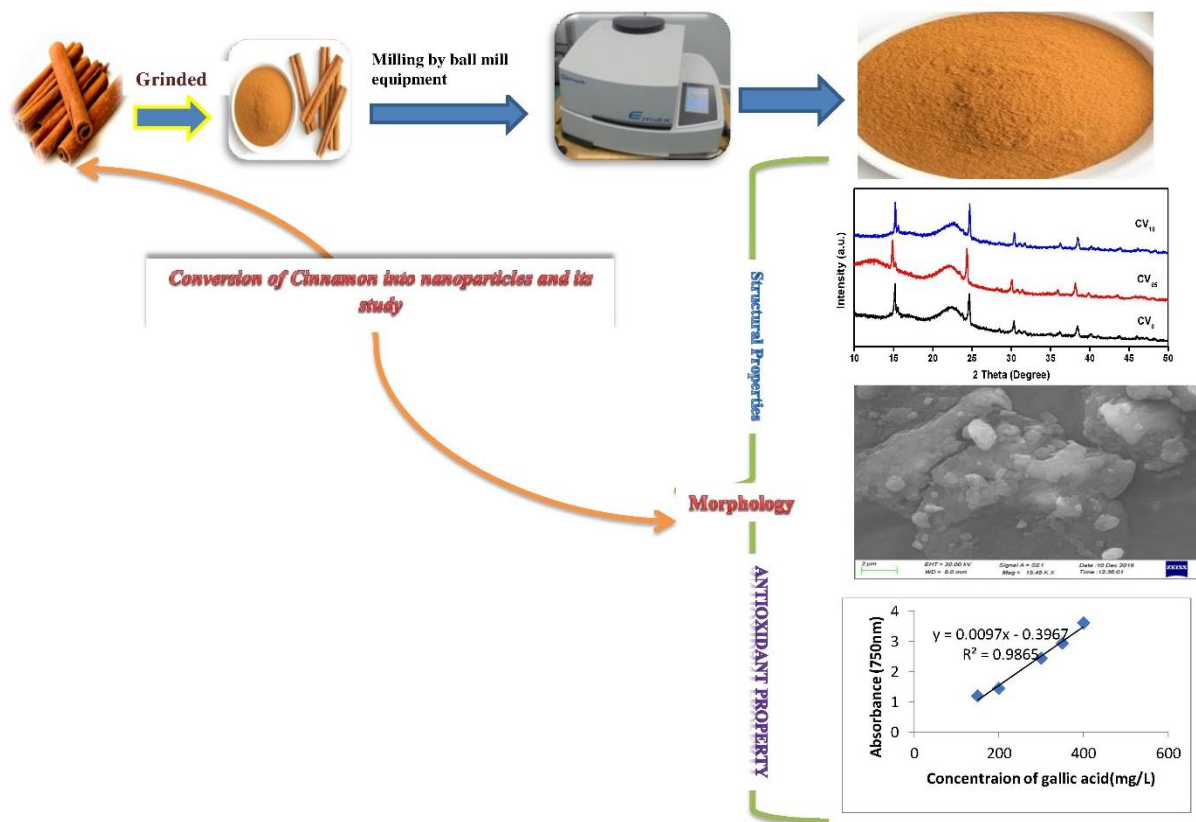
surface modified, i.e., grinded activated alumina. At equilibrium, adsorption capacity was about 28 mg g⁻¹ (i.e., mg of fluoride per g of alumina) in case of activated alumina, whereas it was noted as 39 mg g⁻¹ for grinded activated alumina for pH of 3.0 and fixed fluoride concentration of 100 mgL⁻¹ in aqueous solution. Furthermore, adsorption isotherms and kinetics was performed in which Freundlich model indicated better fit, indicating heterogeneous nonlinear monolayer sorption among adsorbed particles. Correspondingly, pseudo second order kinetics obtained better match with experimental data of fluoride adsorption over pseudo first order kinetics. Overall, the grinded activated alumina can be a prospective adsorbent for treatment of fluoride contaminated water.

2. Research paper/ Manuscript prepared and will be reported shortly on title Preparation of superfine grinding Cinnamon Food Nano powder using high energy ball mill and Evaluation of their Structural and Antioxidant Properties for Applications.

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Highlight of Research paper-

- Superfine Cinnamon food Nano powder of different morphology and crystal structures were successfully prepared using high energy ball milled for High industrial and scientific interest.
- The crystal structure, functional group, were evaluated using modern scientific tools such as X-ray diffraction(XRD), Fourier transform infrared spectroscopy(FTIR) and found considerable change in position of wave number and interplanar distance.
- This present study reveals grinding produces new surface structure, which are beneficial for physicochemical behavior. The changed surface structure was confirmed by SEM measurement.
- The phenolic content, Hydroxyl radicals and superoxide radicals scavenging activity was found to increase as the milling hour and superfine behavior increases. Antioxidant properties also depend on concentration of food powder. . Therefore, the present research finding opens a new window for progress of surface science of food nano powder for **Biomedical powder engineering, pharmaceutical, health and medicine industries.**



Graphical abstract for production of Food nano powder for Biomedical Engineering/Health sector

[B.] Study Materials/E-content related to syllabus through email/WhatsApp.

About 12 text materials/ Documents, which are related to M.Tech/Ph.D. course work/ research project have been sent through WhatsApp group/through mail. Students are studying and asking his/her queries through mobile/email/WhatsApp. About 8 E-content materials are also being uploaded on university website.

[C]. Synopsis preparation of M.Tech/Ph.D. for session 2018-20 and 2018-21 session scholars

Students of M.Tech of session 2018-20, Ph.D. students of session 2018-21 are engaged their synopsis preparation. The synopsis work includes-General introduction, Objective, Literature review, methodology etc. In this week, Some of the students – Gaurav Kumar(M.Tech), Shama Frogen(M.Tech), Shasank Kr Das (M.Tech) and Vivek Kr(Ph.D.) send 1st draft of synopsis through mail for correction. Corrected synopsis was sent for further process. While some of them are engaged in their synopsis writing. They are in touch with mobile/WhatsApp/emails.

[D]. Online Training session on X-ray diffraction and Particle size characterization using Dynamic light hosted by Bruker Company Pvt. Ltd. Kolkata and Antan paar Pvt. Company training office, Delhi on 23rd , 28th April 2010.

Various presenters invited to participate as an attendee in Online Training session on Particle size characterization using DLS and Crystalline structural properties using X-ray diffraction Microscopy, hosted by **Antan paar Pvt. Company training office, Delhi and Bruker training office, Kolkata**. Nanoscience center of AKU is also associated with these company. Some of the M.Tech students of Nanoscience center of AKU informed me for their participation. I had already informed all the students through whats App/email.

[E]. Ph.D. Thesis correction for their evaluation

Ph.D. students, who have completed their thesis work/ Pre-Ph.D. thesis submission presentation completed, are in constant touch for final submission. They send different chapters through mails. In this week one chapter of final thesis correction of Ms. Archana and Md. Qamar Tanbir completed. After correction, I send corrected/with comments documents section to the Ph.D. scholars.

[F]. AMC work of Lab of ACNN, Infrastructure of Teaching lab and Synthesis lab and other related work

We are in touch with vendors/office staff for AMC related file work. Required technical specification and related requirement of infrastructure for teaching and synthesis lab are being prepared. As soon as office resume, we will initiate file for further action. UPS, A.C etc. for structural, magnetic lab are urgently required and we are working for their progress with staff member.

[G]. E-Phatsala linkage access to M. Tech students

E-Phatsala linkage of UGC access is sent through WhatsApp group. Some students are in touch with online courses related to syllabus.

[H] Research project as Co-investigator are being submitted to Govt. of India on the title of the “Evaluation of effect of Rakshoghna Ashtaka Dhoopa as a disinfectant and its therapeutic benefits in COVID-19 Patients: Physical, Mental, Spiritual and Environmental purity through Nanotechnology

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