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## INDEX

Sr.No.	Title of Paper	Author
1	Thermal Performance Analysis of Nano Enhanced Organic Phase Change Material for Solar Thermal Energy Storage Application	Arun Kumar and S.K. Shukla
2	COMPARITIVE ANALYSIS OF PLATE TYPE AND FIN TUBE TYPE HEAT EXCHANGER FOR ORGANIC RANKINE CYCLE	Tarun Kumar Singh, Shailendra Kumar Shukla, Pushpendra Kumar Singh Rathore
3	Cobalt Oxide selective coatings for high temperature solar thermal applications	R. R. Udawant, P.S.Chaudhary, Y.B.Khollam, M.G.Takwale1, K. C. Mohite,
4	Design and development of solar flat plate collector	S. R. Navale, S. N. Dalvi and K. C. Mohite
5	Effect of Ultrasonic Penetration in the Aqueous Beet Root Juice With Respect To Constant Temperature and Pressure	Archana H. Bhapkar, Sunil Kumar Dwivedi, Dr. Bobade D. H.,
6	Study of Structural, Morphological and Dielectric Properties of Copper doped $Ni_{0.3}Cu_{0.3}Mg_{0.3}Zn_{0.2}Fe_3O_4$ Nanoferrite using Sol-gel Technique	V. R. Pande, R. B. Bhise
7	Effect of Surfactants on the structural properties of Zinc Oxide nanocrystals	V.D. Mote, S.P. Kamble
8	Synthesis and Characterization of Pure and Metal Oxide Nanocomposite and their Photocatalytic Study for Methylene Blue Dye Solution	V.R. Huse, S.P. Kamble, D.H. Bobade
9	Synthesis, structural and magnetic studies of Terbium doped ferrite nanoparticles by sol-gel auto combustion technique	Vidyadhar Awati, Dattatray Bobade, Kiran Badave, Anil Kale
10	Chemosynthesis and Characterization of VIB-VA-VIA Group Chalcogenide Thin Films	S. V. Patil P. S. Virkar, S. H. Kawade, P. S. Tathe, P. N. Bhosale
11	An efficient one pot multicomponent synthesis of 1, 4-dihydropyridines using ProHSO4 Bronsted amino acid ionic liquid under solvent-free condition	Nitin R. Rode, Santosh S. Terdale
12	Removal of palladium (II) metal ion by using almond shell activated charcoal	Bajarang Khot, Sachin Shirke, Kiran Badave
13	Measurement of Natural Radioactivity of	G. R. Pansare, Javid Ali, Fareha



## Removal of palladium (II) metal ion by using almond shell activated charcoal Bajarang Khot<sup>a\*</sup>, Sachin Shirke<sup>b</sup>, Kiran Badave<sup>a</sup>

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### ABSTRACT

The activated charcoal synthesized from almond shell used for removal of Pd (II) ions. The almond shell activated charcoal (AAC) provides a high surface area for adsorption of Pd (II) ions. The adsorption capacity of AAC determined as a function of agitation time. The activated charcoal was produced by using physical & chemical activation processes. The activated charcoal sieved through 50 mesh sieve and its characterization carried out by SEM and TEM. The batch experiments carried out by 100 ppm palladium ion solution for removal of Pd (II) ions with agitation time. The analysis of concentration of palladium metal ions at several time intervals analyzed by Atomic Absorption Spectroscopy (AAS). The result obtained from the experiments concluded that removal palladium metal ions are effective at low adsorption dosage of AAC. The AAC utilized and recycled for adsorption.

**KEYWORDS** – heavy metal, palladium, coconut shell, Charcoal, adsorption etc.

### INTRODUCTION

Discharging of industrial waste water is a major problem today's world which contains various toxic metal pollutants. Some metals are useful carry important role in enzymatic reactions and metabolic processes. Metals like palladium, mercury, cadmium, nickel, chromium etc. are highly toxic even at trace level. These toxic metals pollution leads to severe damage along with destruction of environment.

These metals enter human body through food and drinking water. The adverse effects depend on metal and their concentration. Accumulation of these hazardous metals living ones leads disorders in functioning of organs. Palladium and its compounds have wide applications in catalysis, medical applications. This leads to damage of living organisms through food chain causing allergic reactions causing DNA & cell damage.

Adsorption is found to be effective and economic methods than other chemical precipitation, ion exchange, membrane separation, oxidation and reduction techniques for removal of metal impurities.

### SYNTHESIS OF CHARCOAL

Almond shells of obtained from Market, Vashi, Navi Mumbai. These shells crushed into small pieces, washed thoroughly with distilled water which remove the dirt and then sun dried for 24 hours. The dried almond shell pieces were then crushed into fine powder. The powdered almond shells so obtained was soaked in 2N HCl and 2N HNO<sub>3</sub> for 24 hours separately in two beakers. The acid treated powder was washed separately by deionized water until aqueous layer became neutral to pH paper. The material was then sun dried for 48hrs. The powdered almond shell was burnt in muffle furnace at 600°C for 3 hours under nitrogen atmosphere to get almond shell activated charcoal (AAC). AAC sieved through 50 mesh sieves.