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Invention Disk of Nano-Particles of Silver Discs and Fast Adsorption Material to Treatment Water in Dam

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Abstract: *Study depending on using of two chemical compounds consists of silver nano –particle and a ceramic powder order to treatment water in dam. This disk fabrication by silver nano- particles and fast adsorption material as ceramic powder add to articles with specific focus of each even consists of articles and then allowed to dry at room temperature. It is necessary used this disk in tanks of water where give pure water and prevent growth of bacteria inside them and removal of the heavy metals by adsorption from aqueous solution without changing the character of water. Various adsorbents have different adsorption capacities for a few of the toxic metal ions. The best absorbent for pb^{+2} with ceramic and Mg^{+2} where this adsorbent material is suitable for adsorption of toxic metal ions*

1. INTRODUCTION

Heavy metal pollution is one of the main problems (Gunduz, T, Bilge Press,and Ankara (2014)). Toxic metal compounds coming to the earth's surface not only reach the earth's waters (seas, lakes, ponds and reservoirs), but can also contaminate underground water in trace amounts by leaking from the soil after rain and snow. Therefore, the earth's waters may contain various toxic metals. Drinking water is obtained from springs which may be contaminated by various toxic metals (M. G Guzman, J. Dille, S. Godet, *PWASET*, **33**, 367-374 (2008)). Silver nano particle play important role in purification of water and killing deferent type of bacteria where Colloidal particles are increasingly receiving. (A.Sileikaite, I.Prsycevas, j.Puiso, A.Juraitis, (2006)) attention as important starting points for the generation of micro and nanostructures. It comes from small sizes and high surface/volume ratio. Manufacturing entire objects from pure silver metal or coating them with silver is prohibitively expensive for consumer items but research has found that impregnating other materials may be where may be occur adsorption for organic compounds on surface of colloidal particles where this particle act as adsorbent has high surface. Surface Plasmon resonance induced by silver (Ag) (B. Choi, H.Lee, S. Jin, S.Chun, S.H Kim (2007)) nano particles leads to an increase in an absorption coefficient of the organic compounds effect has been theoretically described as an increase of local electromagnetic field nearby metal surfaces which is found when wavelengths (M. G Guzman, J. Dille, S. Godet, (2008)) of irradiation sources are correlated with the optical absorption of the surface Plasmon resonance. In this study, for a cost-effective process. Back ground of the invention lies in (S.S.Narayanan, S.K.Pal, (2008)) and (P.R Murray, K.S Rosenthal (2002)). That the best absorbent for Pb^{+2} is ceramic (sawsan M. Abu.Hassan. (2014)). The best absorbent for Hg^{+2} is activated carbon , the best absorbent for Zn^{+2} and Ca^{+2} is silica (sawsan M. Abu.Hassan.(2014)) and (AL-Imarah, F.J, and Sahil, M.K (2006)). And the best absorbent for Mg^{+2} is silica and activated carbon. the best absorbent for Pb^{+2} and Hg^{+2} is activated carbon with silica and ceramic with activated carbon, the best absorbent for Zn^{+2} and Mg^{+2} is silica with ceramic and activated carbon ceramic the best absorbent for Ca^{+2} is silica with activated carbon (Bae, J. Y.; Choi, S. H.; Bae, B. S .and Bull. Kor, Chem. Soc. (2006)).. the best filter for removal heavy metals is contain three layers of activated carbon with silica and ceramic where obtain 100% of absorbance for ions Cho, S. Y.; Kim, N.-R.; Cao, G.; Kim, J.-G.; Chung, C. M. and Bull. Kor. (2006)).

2. EXPERIMENT

2.1. Preparation of Silver Nano-Particle

Take 0.17 g of $AgNO_3$ in 100ml of distilled water and boiling it then add 0.103 g of sodium triacetate contain two molecule of water in 10 ml of distilled water add this solution to silver

nitrite solution will appear yellow color. It is most popular preparation of Ag colloids is chemical reduction of silver salts by sodium borohydride or sodium tricitrate. This preparation is simple, but the great care must be exercised to make stable and reproducible colloid2. (Lundahl P., R.Stokes, E. Smith, R. Martin, D.Graham, (2008)).

Mechanism of reaction could be expressed as follows:

$$4Ag + + C_6H_5O_7Na_3 + 2H_2O \rightarrow 4Ag^0 + C_6H_5O_7H_3 + 3Na^+ + H^+ + O_2\uparrow$$

2.2. Preparation of Discs

Silver nano particles prepared by chemical method in plant of silver nitrate in 50 ml of water and weight of 0.103g of sodium citrate in 10 ml of water and leave silver nitrate to boil then add the sodium citrate until yellow attends the adsorbent and add nano particles prepared until the dough is left to dry at room temperature per disk.

2.3. The Percentage Removal of Elements and the Amount of Element Adsorbed on Adsorbent (Qe) Were:

Calculated, respectively, as follows (Raman, N. K.; Anderson, M. T. and Brinker, C. (1996)).

$\%Removal = (C_0\text{-}Ce/C_0)\ x100$

$qe = (C_0\text{-}Ce/M)V$

Where qe is the amount of ion adsorbed on adsorbent at equilibrium, 0 and are the initial and equilibrium of element concentration in solution, respectively, is the volume of solution (l), and is the weight of adsorbent(g).

3. RESULT

Note After you add a disk to record a sample of water containing a number of heavy elements is the final disposal of the solid elements that due to the presence of adsorbed layer made of ceramic when examining the impact of disk on a sample of bacteria in the water that are discarded and we get clean water and when you keep a disc inside the barrels of water for three days, we note that the growth of any fungus or bacteria in the tank that is the purpose of the manufacture of these disks where placed inside the barrels of water to prevent the growth of bacteria, fungi and algae, as well as purification of harmful and hazardous elements such as lead and cadmiums and elements of salinity as shown.in.table(1-2) .

Table1. *Effect of ceramic and silver nano particle on the percentage removal of elements and the amount of element adsorbed on adsorbent*

Element	Pb+2	Hg+2	Zn+2	Ca+2	Mg+2
%removal	100%	20%	64%	20%	80%
qe	0.05	0.01	0.032	0.01	0.04

Table2. *Antimicrobial activity for disk silver nano particle and ceramic*

Compounds	Effect on gram –v bacteria	Effect on gram +v bacteria
Disk of nano-particle and ceramic	+++	+++
Disk of nano-particle and ceramic	++	+

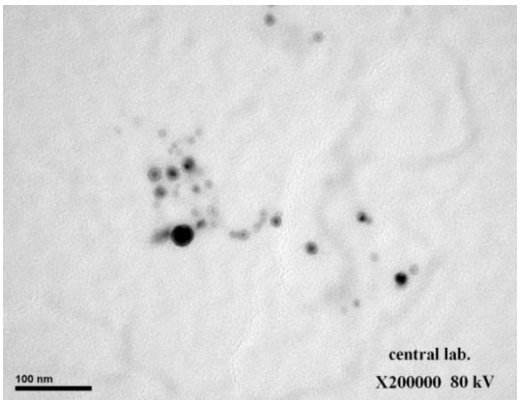

Fig1. *Showing SEM image of nano particles produced*

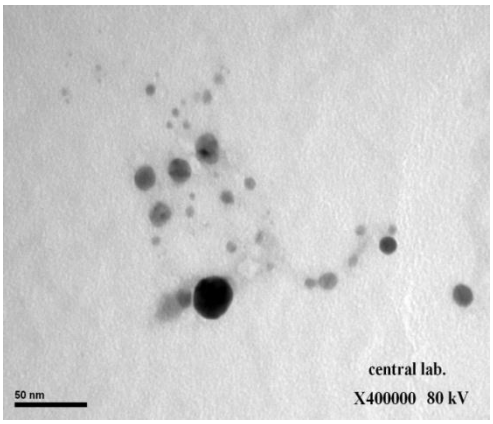

Fig2. *Showing SEM image of nano particles produced*

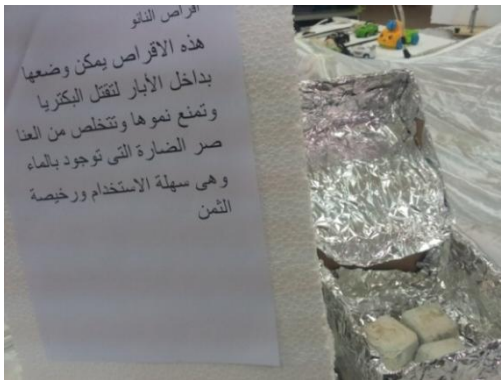

Fig3. *Showing disk of silver nano particle and ceramic powder*

4. CONCLUSION

It can be concluded that it is necessary used this disk in tanks of water where give pure water and prevent growth of bacteria inside them and removal of the heavy metals by adsorption from aqueous solution without changing the conditions. Various adsorbents have different adsorption capacities for a few of the toxic metal ions. The best absorbent for pb^{+2} with ceramic and Mg^{+2} where This adsorbent material is suitable for adsorption of toxic metal ions (sawsan M.Abu.El-Hassan)..

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