Antibacterial activity of copper nanoparticles

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In the name of

Allah,

The most Compassionate,

The most merciful

DECLARATION

I **ANUM ASHRAF** D/O **MUHAMMAD ASHRAF**

ID: **14005067010**, Session **2013-2017** hereby declare that the matter printed in the thesis titled ***"Antibacterial Activity Of Copper Nanoparticles "*** is my own work and has not been printed, published and submitted as research work, thesis or publication in any form in any University, Research institution etc. in Pakistan or Abroad.

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(Anum Ashraf)

RESEARCH COMPLETION CERTIFICATE

Certified that the research work contained in this thesis titled, "**Antibacterial Activity Of Copper Nanoparticles "** has been carried out and completed by **ANUM ASHRAF, ID: 14005067010.**

The quantum and the quality of the work contained in this thesis is adequate for the award of Degree of BS in Chemistry.

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Dedication

I dedicate my dissertation work to my family and all my Teachers. This thesis work is dedicated to my father, MUHAMMD ASHRAF, who has been a constant source of support and encouragement during the challenges of graduate School and life. I am truly thankful for having you in my life. I also dedicate this work to my sister RABBIA. A special feeling of gratitude to my loving parents MUHAMMAD ASHRAF and ULFAT SEHNAZ whose words of encouragement and push for tenacity ring in my ears who have always loved me unconditionally and whose good examples have taught me to work hard for the things that I aspire to achieve.

I also dedicate this dissertation to my all teachers whose efforts make me able to get such wonderful experiences of learning from my childhood. I always appreciate all they have done for helping me in development my technical skills and for helping me to master the leader dots.

Finally, this thesis is dedicated to all those who believe in the richness of learning.

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ABSTRACT

The antibacterial activity were studied by Agar well Diffusion, first copper nanoparticles were synthesized by wet chemical method using copper sulphate pentahydrate, sodium lauryl sulfate and hydrazine as reducing agent. Synthesized nanoparticles were characterized by XRD. To check the antibacterial activity of copper nanoparticles against different bacteria like *Eschericia coli, Streptococcus mutans, Staphylococcus areus, Pseudomonas* and *Klebsiella pneumonia,* slant, inoculum and petri dishes were prepared for this purpose. Amoxicillin was used as standard antibiotic and distilled water was used as a solvent. Amoxicillin is very famous antibiotic. Dilutions of 1%, 0.5% 0.125% 0.25% respectively. Copper nanoparticles have highest antibacterial activity against *Klebsiella pneumoniae* for 1% concentration and lowest efficiency against *Pseudomonas* for 0.5% concentration. Therefore, it can be concluded that copper nanoparticles showed good efficiency against bacteria and can also be used as antibiotic in medicine.

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Contents

1.0 INTRODUCTION

1.1 Nanoparticles -History and Development:

Nanoparticles were historically developed by Ursula Scheffel and his colleagues at the Eth Zurich during late from 1960's to 1970's respectively. The historical development of nanoparticles can be estimated from 9th period in Mesopamia. At that time the artisans used these particles for the purpose to produce the glittering effect on the surface of pots.