ANTIBACTERIAL ACTIVITY OF COPPER OXIDE NANOPARTICLES

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In the name of

Allah,

The most Compassionate,

The most merciful

Thesis Similarity Report

DECLARATION

I **MEHSHAAR GUL** D/O **GHAZANFAR ALI**

ID: **14005067009**, Session **2013-2017** hereby declare that the matter printed in the thesis titled ***"ANTIBACTERIAL ACTIVITY OF COPPER OXIDE 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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Certified that the research work contained in this thesis titled, "**ANTIBACTERIAL ACTIVITY OF COPPER OXIDE NANOPARTICLES"** has been carried out and completed by **MEHSHAAR GUL, ID: 14005067009.**

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, GHAZANFAR ALI, 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 mother MUSARRAT JABIN. A special feeling of gratitude to my loving parents GHAZANFAR ALI and MUSARRAT JABIN 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

Antibiotic drugs are resistant against bacteria and there is need to search for new antibiotic drugs that are more resistant against these bacteria. Copper oxide nanoparticles were synthesized by using copper sulphate pentahydrate and sodium lauryl sulfate. To check the antibacterial activity of the copper oxide nanoparticles against different bacteria like *Eschericia coli, Streptococcus mutans, Staphylococcus areus, Pseudomonas* and *Klebsiella pneumonia,* petri dishes were prepared. Amoxicillin was used as standard antibiotic and distilled water was used as solvent. Amoxicillin is very famous antibiotics as compared to other beta-lactam antibiotics. It works against Gram-negative bacteria more effectively as compare to Gram positive bacteria. Dilutions of copper oxide nanoparticles were prepared of 2%, 1% and 0.5% respectively. Nanoparticles were characterized by using XRD technique. Copper oxide nanoparticles showed the antibacterial activity against all of the bacteria by agar well diffusion method. Copper oxide nanoparticles showed the highest efficiency against *Eschericia coli* for 2% concentration and lowest efficiency against *Pseudomonas* and *Klebsiella pneumonia* for 0.5% concentration. Therefore, it can be concluded that copper oxide nanoparticles show efficiency against bacteria and can also be used as antibiotic in medicine field as well as in paints, coatings, and textile.

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1.0. INTRODUCTION

1.1. Nanoparticles

Nanoparticles are particulate solid particles ranging from 10-1000nm. Nanoparticles, nanocapsules or nanospheres can be obtained depending on the preparation of nanoparticles that drug is dissolved or attached to the nanoparticles matrix. Drug is dispersed physically and uniformly in the case of nanospheres, but in case of nanocapsules drug in cavity is restricted that is surrounded by polymer. Designing of nanoparticles for delivery system goals are to achieve surface properties, particle size and dose regimen. Liposomes used to reduce toxicity, protection of drugs from degradation and from some others side effects too. While polymeric nanoparticles increase stability of drugs.