

SYNTHESIS, CHARACTERIZATION AND
BIOLOGICAL APPLICATIONS OF
AMOXICILLIN TRIHYDRATE
COMPLEXES WITH COPPER (II), IRON
(II), MANGANESE (II)



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**SYNTHESIS, CHARACTERIZATION AND
BIOLOGICAL APPLICATIONS OF
AMOXICILLIN TRIHYDRATE
COMPLEXES WITH COPPER (II), IRON
(II), MANGANESE (II)**

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**BS
IN
CHEMISTRY**

**BY
SAMIA SHOUKAT**

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SESSION: 2012-2016



In the name of

Allah,

The most Beneficent,

The most merciful

Thesis Similarity Report

DECLARATION

I SAMIA SHOUKAT D/O SHOUKAT MEHMOOD

ID: 12002067003, Session 2012-2016 hereby declare that the matter printed in the thesis titled “*Synthesis, Characterization and Biological Applications of Amoxicillin Trihydrate Complexes with Copper (II), Iron (II), Manganese (II)*” 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.

Dated: _____

(SAMIA SHOUKAT)



RESEARCH COMPLETION CERTIFICATE

Certified that the research work contained in this thesis titled, “**Synthesis, Characterization and Biological Applications of Amoxicillin Trihydrate Complexes with Copper (II), Iron (II), and Manganese (II)**” has been carried out and completed by **SAMIA SHOUKAT, ID: 12002067003**.

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, SHOUKAT MEHMOOD, 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 Ma,m UROOJ FATIMA. A special feeling of gratitude to my loving parents SHOUKAT MEHMOOD and KOUSAR PARWEEN 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

Diseases are the challenge for human being as old as man himself. In every era of life people try to overcome and cure these diseases. For that purpose plants are the natural resources of drugs which are produced during different process of life as by-product. Amoxicillin is an antibiotic drug of class penicillin. The first Amoxicillin became presented in 1972. On the World Health Organization's List of Essential Medicines, it is the most important medications needed in a basic health system. One of the most commonly prescribed antibiotics in children. Amoxicillin is available as a generic medication. It is usually the drug of choice within the class because it is better-absorbed, following oral administration, than other β -lactam antibiotics. This drug acts by inhibiting the synthesis of bacterial cell walls. It inhibits cross-linkage between the linear peptidoglycan polymer chains that make up basic component of the cell walls of both Gram-positive and Gram-negative bacteria. Amoxicillin has three ionisable groups in the physiological range i.e. amino group, amide carbonyl group and the carboxyl group. Amoxicillin is active with both gram positive and gram negative bacteria. The lactam ring inhibits bacterial growth by proteolysis mechanism. This antibiotic used to treat bacterial infections caused by microorganisms. Amoxicillin degraded its β -lactam ring and produced clavulanic acid to increase its susceptibility in the presence of β -lactamase. Amoxicillin is a very popular, safe antibiotic. Copper come from its ability to control the growth of organisms. This occurs when copper is biologically available in required concentration. Copper has been established to be an effective antibacterial, antiplaque agent in mouthwashes and toothpastes. Copper also continues to be widely used for the control of unwanted organisms in fish farming (Chain, 1940). Copper antifouling agents used on fish net pens. Copper is stemming from their potential use as antimicrobial, antiviral, anti-inflammatory, antitumor agents, enzyme inhibitors or chemical nucleases. The biochemical action of copper complexes with anti-Bacterial drugs has been studied. Numerous copper showing greater anti-inflammatory activity, as well as reduced toxicity compared to the uncomplexed drug, have been prepared and structurally characterized. Copper also helpful in the design and production of antiviral and antibacterial materials, able to deactivate viruses and antibiotic-resistant bacteria.

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