

الآية

قال تعالى :

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

﴿وَاللَّهُ أَخْرَجَكُمْ مِنْ بُطُونِ أُمَّهَاتِكُمْ لَا تَعْلَمُونَ شَيْئًا وَجَعَلَ لَكُمُ السَّمْعَ وَالْأَبْصَارَ

وَالْأَفْئِدَةَ ۗ لَعَلَّكُمْ تَشْكُرُونَ﴾

صدق الله العظيم

سورة النحل الآية ﴿78﴾

Dedication

I dedicate To my wonderful brothers and friends who supported me throughout my academic stages . To the people who paved our way of science and knowledge . Special feeling of gratitude to my parents... The fountain of patience and optimism and hope . I will appreciate all things they have done for me .

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Abstract

The basic structure of cuprates consists of CuO_2 layers. These copper oxide materials are responding to physics of superconductivity. The $d_{x^2-y^2}$ orbital state of the Cu^{2+} ions, suggest that electron-electron interactions are more significant than electron-phonon interactions in cuprates making the superconductivity unconventional. And also the d-wave pairing state is dominant in the cuprate. In this thesis we explain that $d_{x^2-y^2}$ play important role in high temperature superconductivity.

الملخص

يتكون الهيكل الأساسي لمركبات أكسيد النحاس التي تتميز بالتوصيل الفائق عند درجات الحرارة العالية من طبقات أكسيد النحاس وهي المسؤولة عن فيزياء الموصلية الفائقة . ووجد أن التفاعل بين الالكترونات هو الأكثر أهمية من التفاعل بين الإلكترون و الفونون في أيون النحاس، وأن المدار $d_{x^2-y^2}$ هو المهيمن و المسؤول عن التوصيل الفائق عند درجات الحرارة العالية . تم في هذا البحث المقارنة بين المدار (S) الذي يحقق نظرية BCS والمدار $d_{x^2-y^2}$ الذي يصف التوصيل الفائق عند درجات الحرارة العالية.

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