

The American University in Cairo  
School of Sciences and Engineering

# Transition Metal Phosphides for High-Performance Electrochemical Energy Storage Devices

A Dissertation Submitted by

**Amina Mohamed Ayman Saleh**

To the

PhD in Applied Sciences Graduate Program

January 13, 2022

In partial fulfillment of the requirements for the degree of

**PhD. in Applied Sciences with a Specialization in Nanotechnology**

Has been approved by

Dr. Nageh Allam (Advisor)  
Professor & Director of Nanotechnology Graduate Program  
Physics Department  
American University in Cairo

DocuSigned by:  
*Prof. Nageh Allam*  
CC03BE4FF808475...

Dr. Hanadi Salem (Internal Examiner)  
Professor & Chair, Mechanical Engineering Department  
American University in Cairo

DocuSigned by:  
*Dr. Hanadi Salem*  
1D2D0E4C1E76496...

Dr. Ehab El Sawy (Internal Examiner)  
Assistant Professor, Chemistry Department  
American University in Cairo

DocuSigned by:  
*Dr. Ehab El Sawy*  
861B3C0CC8AA475...

Dr. Clara Santato (External Examiner)  
Professor of Photoelectrochemistry and optoelectronics  
Engineering Physics Department, Polytechnique Montréal, Canada

DocuSigned by:  
*Clara Santato*  
8272D062E4AB4E0...

Dr. Iman El-Mahallawi (External Examiner)  
Professor of Mechanical Engineering & Founding Director of Center for Renewable Energy CRE  
The British University in Egypt (BUE)

DocuSigned by:  
*Prof. Iman El-Mahallawi*  
91C7D300C5DD498...

Dr. Tarek El Sayed (Moderator)  
Assistant Professor, Physics Department  
American University in Cairo

DocuSigned by:  
*Dr. Tarek El Sayed*  
6AE4339B104B4F3...

DocuSigned by:  
*Prof. Nageh Allam*  
1/14/2022  
Date

DocuSigned by:  
*Lotfi Gaafar*  
922102023BF04F0...  
Date

1/17/2022  
Date

Graduate Program Director

Dean

Date