



**Sudan University of Science and Technology**



**College of Graduate Studies**

**The Use of Glass Fiber Reinforced Epoxy Composite in  
Automotive Bumper Applications**

**إستخدام المواد المركبة من الألياف الزجاجية المقواة بالإيبوكسي في تطبيقات  
صدام السيارات**

**A Thesis Submitted to Postgraduate Studies at Sudan University of  
Science and Technology in Fulfillment for the Requirement of  
Doctor of Philosophy in Polymer Engineering**

**By**

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